# AMS 1988 OFFICE BENEFITS SURVEY

The AMS 1988 Office Benefits Survey was conducted of AMS member companies in mid-1988. Some 1,103 companies responded to the survey, largely consisting of small to medium-sized firms of various types located throughout North America. Given the substantial number of companies in the survey, the figures obtained are considered to reasonably represent trends in the policies of North American businesses.

The survey covers 22 benefits-related policies in three categories: insurance plans, paid leave, and supplementary benefits. Statistics are reported for these categories by:

- Nine types of business
  - Manufacturing/Processing/Construction
  - Utilities/Transportation/Communication
  - Banking/Finance
  - Insurance
  - Retail/Wholesale Sales & Distribution
  - Service
  - Professional (Medical, Legal, etc.)
  - Education/Nonprofit/Government
  - Other
- Five company sizes
  - 1-25 employees
  - 26-100 employees
  - 101-500 employees
  - 501-1,000 employees
  - over 1,000 employees
- Five U.S. regions; plus Canada
  - Northeast — ME, VT, NH, MA, RI, CT, NY, NJ, PA, DE, MD, DC
  - Great Lakes — OH, IN, IL, MI, WI
  - South — VA, WV, KY, TN, NC, SC, GA, FL, AL, MS, LA, AR, TX, OK
  - Midwest — MN, IA, MO, ND, SD, NE, KS
  - West — CA, OR, WA, ID, MT, WY, CO, UT, NV, AZ, NM

## ABOUT AMS

The Administrative Management Society (AMS) is a professional management association serving over 8,000 members in over 125 chapters throughout the United States and Canada. AMS is dedicated to the successful management of people and procedures in the office. Those who are involved or are interested in management are eligible for membership.

AMS provides its members with *Management World* magazine, as well as newsletters, salary and personnel policy surveys, an annual conference, chapter meetings and programs, a certification program, and other services directed toward management development.

For further information about other AMS survey reports, see the last page of this report.

For information about membership in AMS, write or call AMS, 4622 Street Road, Trevose, PA 19047; 215-953-1040.

**AMS Administrative Management Society**
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U.S.$30 ($15 to AMS members)

# Insurance Plans — Type of Business

PERCENT

| | TOTAL U.S. | MANU./ PROC./ CONST. | UTIL./ TRANS./ COMM. | BANK./ FIN. | INS. | RET./ WHOLE. | SERV. | PROF. | EDUC./ GOVT./ NON. | OTHER |
|---|---|---|---|---|---|---|---|---|---|---|
| **HOSPITALIZATION** | | | | | | | | | | |
| Paid by Company in Full | 48 | 50 | 52 | 38 | 36 | 43 | 53 | 54 | 56 | 51 |
| Company/Employee Share Cost | 43 | 45 | 40 | 56 | 52 | 42 | 34 | 38 | 36 | 41 |
| Paid by Employee in Full | 3 | 3 | 6 | 3 | 2 | 6 | 4 | 1 | 3 | 1 |
| No plan | 6 | 2 | 2 | 3 | 10 | 9 | 9 | 7 | 5 | 7 |
| **SURGICAL** | | | | | | | | | | |
| Paid by Company in Full | 47 | 49 | 52 | 36 | 35 | 41 | 50 | 51 | 55 | 52 |
| Company/Employee Share Cost | 41 | 45 | 40 | 55 | 51 | 42 | 31 | 33 | 36 | 40 |
| Paid by Employee in Full | 4 | 3 | 4 | 6 | 4 | 6 | 5 | 4 | 5 | 2 |
| No plan | 8 | 3 | 4 | 3 | 10 | 11 | 13 | 12 | 4 | 6 |
| **MAJOR MEDICAL** | | | | | | | | | | |
| Paid by Company in Full | 48 | 48 | 56 | 35 | 39 | 43 | 52 | 52 | 54 | 50 |
| Company/Employee Share Cost | 42 | 44 | 38 | 56 | 52 | 43 | 33 | 35 | 39 | 43 |
| Paid by Employee in Full | 5 | 4 | 4 | 6 | 5 | 7 | 6 | 4 | 3 | 2 |
| No plan | 5 | 4 | 2 | 3 | 4 | 7 | 9 | 9 | 3 | 5 |
| **SHORT-TERM DISABILITY** | | | | | | | | | | |
| Paid by Company in Full | 44 | 57 | 48 | 44 | 48 | 38 | 34 | 33 | 37 | 49 |
| Company/Employee Share Cost | 13 | 17 | 12 | 13 | 11 | 17 | 15 | 10 | 9 | 9 |
| Paid by Employee in Full | 3 | 2 | 6 | 6 | 5 | 8 | 4 | 1 | 1 | 1 |
| No plan | 40 | 24 | 34 | 37 | 36 | 37 | 47 | 56 | 53 | 41 |
| **LONG-TERM DISABILITY** | | | | | | | | | | |
| Paid by Company in Full | 48 | 46 | 64 | 55 | 62 | 33 | 38 | 50 | 46 | 52 |
| Company/Employee Share Cost | 21 | 25 | 14 | 23 | 23 | 20 | 21 | 16 | 22 | 17 |
| Paid by Employee in Full | 3 | 2 | 8 | 5 | 4 | 4 | 5 | 1 | 3 | 1 |
| No plan | 28 | 27 | 14 | 17 | 11 | 43 | 36 | 33 | 29 | 30 |
| **DENTAL** | | | | | | | | | | |
| Paid by Company in Full | 32 | 36 | 48 | 20 | 29 | 22 | 31 | 28 | 42 | 31 |
| Company/Employee Share Cost | 30 | 30 | 20 | 41 | 41 | 27 | 21 | 29 | 28 | 33 |
| Paid by Employee in Full | 4 | 2 | 10 | 5 | 2 | 5 | 3 | 1 | 3 | 8 |
| No plan | 34 | 32 | 22 | 34 | 28 | 46 | 45 | 42 | 27 | 28 |
| **OPTICAL** | | | | | | | | | | |
| Paid by Company in Full | 10 | 15 | 16 | 9 | 8 | 2 | 4 | 13 | 10 | 12 |
| Company/Employee Share Cost | 7 | 8 | 2 | 8 | 9 | 7 | 6 | 7 | 7 | 10 |
| Paid by Employee in Full | 1 | 1 | 6 | 2 | 1 | 2 | 1 | 1 | 1 | 1 |
| No plan | 82 | 76 | 76 | 81 | 82 | 89 | 89 | 79 | 82 | 77 |
| **LIFE** | | | | | | | | | | |
| Paid by Company in Full | 62 | 68 | 64 | 67 | 57 | 58 | 53 | 67 | 61 | 69 |
| Company/Employee Share Cost | 23 | 22 | 28 | 23 | 33 | 20 | 20 | 20 | 24 | 23 |
| Paid by Employee in Full | 4 | 4 | 6 | 3 | 3 | 4 | 6 | 2 | 3 | 1 |
| No plan | 11 | 6 | 2 | 7 | 7 | 18 | 21 | 11 | 12 | 7 |
| **PENSION** | | | | | | | | | | |
| Paid by Company in Full | 52 | 59 | 64 | 69 | 63 | 35 | 37 | 49 | 53 | 54 |
| Company/Employee Share Cost | 13 | 13 | 16 | 6 | 10 | 11 | 8 | 7 | 2 | 17 |
| Paid by Employee in Full | 3 | 3 | 8 | 3 | 3 | 3 | 3 | 2 | | 3 |
| No plan | 32 | 25 | 12 | 22 | 24 | 51 | 52 | 42 | | 26 |
| Percent of Payroll Company Spends for All Insurance | 16 | 19 | 18 | 18 | 17 | 13 | 13 | 13 | 15 | 15 |

# Insurance Plans — Company Size (By Employees)

PERCENT

| | TOTAL U.S. | 1-25 EMPLOYEES | 26-100 EMPLOYEES | 101-500 EMPLOYEES | 501-1,000 EMPLOYEES | OVER 1,000 EMPLOYEES |
|---|---|---|---|---|---|---|
| **HOSPITALIZATION** | | | | | | |
| Paid by Company in Full | 48 | 63 | 51 | 45 | 31 | 38 |
| Company/Employee Share Cost | 43 | 22 | 42 | 48 | 58 | 55 |
| Paid by Employee in Full | 3 | 3 | 3 | 4 | 4 | 2 |
| No Plan | 6 | 12 | 4 | 3 | 7 | 5 |
| **SURGICAL** | | | | | | |
| Paid by Company in Full | 47 | 59 | 51 | 44 | 28 | 38 |
| Company/Employee Share Cost | 41 | 21 | 39 | 47 | 56 | 54 |
| Paid by Employee in Full | 4 | 4 | 5 | 5 | 7 | 1 |
| No Plan | 8 | 16 | 5 | 4 | 9 | 6 |
| **MAJOR MEDICAL** | | | | | | |
| Paid by Company in Full | 48 | 61 | 52 | 46 | 27 | 37 |
| Company/Employee Share Cost | 42 | 23 | 40 | 46 | 64 | 56 |
| Paid by Employee in Full | 5 | 4 | 5 | 5 | 9 | 2 |
| No Plan | 5 | 12 | 3 | 3 | 0 | 5 |
| **SHORT-TERM DISABILITY** | | | | | | |
| Paid by Company in Full | 44 | 27 | 43 | 48 | 53 | 56 |
| Company/Employee Share Cost | 13 | 13 | 10 | 12 | 10 | 20 |
| Paid by Employee in Full | 3 | 2 | 2 | 5 | 4 | 4 |
| No Plan | 40 | 58 | 45 | 35 | 33 | 20 |
| **LONG-TERM DISABILITY** | | | | | | |
| Paid by Company in Full | 48 | 32 | 51 | 55 | 50 | 52 |
| Company/Employee Share Cost | 21 | 14 | 18 | 23 | 25 | 29 |
| Paid by Employee in Full | 3 | 3 | 4 | 2 | 6 | 4 |
| No Plan | 28 | 51 | 26 | 20 | 19 | 15 |
| **DENTAL** | | | | | | |
| Paid by Company in Full | 32 | 27 | 32 | 34 | 28 | 35 |
| Company/Employee Share Cost | 30 | 17 | 26 | 34 | 33 | 46 |
| Paid by Employee in Full | 4 | 4 | 3 | 5 | 4 | 3 |
| No Plan | 34 | 52 | 39 | 27 | 35 | 16 |
| **OPTICAL** | | | | | | |
| Paid by Company in Full | 10 | 8 | 7 | 10 | 9 | 14 |
| Company/Employee Share Cost | 7 | 3 | 7 | 8 | 5 | 15 |
| Paid by Employee in Full | 1 | 1 | 2 | 1 | 1 | 1 |
| No Plan | 82 | 88 | 84 | 81 | 85 | 70 |
| **LIFE** | | | | | | |
| Paid by Company in Full | 62 | 57 | 67 | 66 | 60 | 54 |
| Company/Employee Share Cost | 23 | 13 | 19 | 25 | 31 | 37 |
| Paid by Employee in Full | 4 | 3 | 5 | 3 | 5 | 5 |
| No Plan | 11 | 27 | 9 | 6 | 4 | 4 |
| **PENSION** | | | | | | |
| Paid by Company in Full | 52 | 27 | 51 | 59 | 64 | 70 |
| Company/Employee Share Cost | 13 | 11 | 9 | 15 | 13 | 16 |
| Paid by Employee in Full | 3 | 2 | 3 | 3 | 6 | 4 |
| No Plan | 32 | 60 | 37 | 23 | 17 | 10 |
| Percent of Payroll Company Spends for All Insurance | 16 | 13 | 16 | 17 | 20 | 19 |

# Insurance Plans — Region

PERCENT

| | TOTAL U.S. | NORTHEAST | GREAT LAKES | SOUTH | MIDWEST | WEST | TOTAL CANADA |
|---|---|---|---|---|---|---|---|
| **HOSPITALIZATION** | | | | | | | |
| Paid by Company in Full | 48 | 55 | 45 | 47 | 39 | 58 | 40 |
| Company/Employee Share Cost | 43 | 37 | 45 | 45 | 51 | 29 | 43 |
| Paid by Employee in Full | 3 | 2 | 5 | 3 | 4 | 2 | 3 |
| No Plan | 6 | 6 | 5 | 5 | 6 | 11 | 14 |
| **SURGICAL** | | | | | | | |
| Paid by Company in Full | 47 | 54 | 44 | 45 | 38 | 57 | 35 |
| Company/Employee Share Cost | 41 | 36 | 44 | 43 | 50 | 28 | 32 |
| Paid by Employee in Full | 4 | 3 | 6 | 5 | 4 | 2 | 4 |
| No Plan | 8 | 7 | 6 | 7 | 8 | 13 | 29 |
| **MAJOR MEDICAL** | | | | | | | |
| Paid by Company in Full | 48 | 54 | 44 | 46 | 39 | 60 | 44 |
| Company/Employee Share Cost | 42 | 38 | 44 | 45 | 51 | 30 | 35 |
| Paid by Employee in Full | 5 | 3 | 7 | 5 | 4 | 2 | 3 |
| No Plan | 5 | 5 | 5 | 4 | 6 | 8 | 18 |
| **SHORT-TERM DISABILITY** | | | | | | | |
| Paid by Company in Full | 44 | 51 | 47 | 38 | 41 | 36 | 52 |
| Company/Employee Share Cost | 13 | 12 | 11 | 16 | 11 | 14 | 21 |
| Paid by Employee in Full | 3 | 0 | 4 | 6 | 4 | 3 | 7 |
| No Plan | 40 | 37 | 38 | 40 | 44 | 47 | 21 |
| **LONG-TERM DISABILITY** | | | | | | | |
| Paid by Company in Full | 48 | 51 | 50 | 48 | 45 | 41 | 45 |
| Company/Employee Share Cost | 21 | 17 | 18 | 25 | 25 | 24 | 37 |
| Paid by Employee in Full | 3 | 1 | 5 | 4 | 4 | 2 | 6 |
| No Plan | 28 | 31 | 27 | 23 | 26 | 33 | 12 |
| **DENTAL** | | | | | | | |
| Paid by Company in Full | 32 | 30 | 37 | 29 | 24 | 47 | 47 |
| Company/Employee Share Cost | 30 | 27 | 29 | 32 | 33 | 30 | 32 |
| Paid by Employee in Full | 4 | 3 | 3 | 4 | 5 | 2 | 4 |
| No Plan | 34 | 40 | 31 | 35 | 38 | 21 | 17 |
| **OPTICAL** | | | | | | | |
| Paid by Company in Full | 10 | 9 | 10 | 5 | 6 | 25 | 33 |
| Company/Employee Share Cost | 7 | 5 | 9 | 5 | 8 | 12 | 22 |
| Paid by Employee in Full | 1 | 1 | 1 | 3 | 1 | 0 | 3 |
| No Plan | 82 | 85 | 80 | 87 | 85 | 63 | 42 |
| **LIFE** | | | | | | | |
| Paid by Company in Full | 62 | 65 | 64 | 57 | 63 | 58 | 53 |
| Company/Employee Share Cost | 23 | 21 | 25 | 28 | 23 | 17 | 35 |
| Paid by Employee in Full | 4 | 3 | 4 | 5 | 4 | 2 | 2 |
| No Plan | 11 | 11 | 7 | 10 | 10 | 23 | 10 |
| **PENSION** | | | | | | | |
| Paid by Company in Full | 52 | 55 | 59 | 45 | 51 | 44 | 23 |
| Company/Employee Share Cost | 13 | 13 | 10 | 16 | 14 | 10 | 49 |
| Paid by Employee in Full | 3 | 3 | 4 | 3 | 2 | 3 | 3 |
| No Plan | 32 | 29 | 27 | 36 | 33 | 43 | 25 |
| Percent of Payroll Company Spends for All Insurance | 16 | 17 | 17 | 15 | 16 | 18 | 12 |

# Paid Leave — Type of Business

| | TOTAL U.S. | MANU./ PROC./ CONST. | UTIL./ TRANS./ COMM. | BANK./ FIN. | INS. | RET./ WHOLE. | SERV. | PROF. | EDUC./ GOVT./ NON. | OTHER |
|---|---|---|---|---|---|---|---|---|---|---|
| **AVERAGE VACATION DAYS** | | | | | | DAYS | | | | |
| **(According to Service)** | | | | | | | | | | |
| 1/2 year | 3.8 | 3.5 | 2.7 | 3.9 | 4.0 | 3.2 | 3.2 | 4.7 | 4.5 | 4.0 |
| 1 year | 9.1 | 8.8 | 9.0 | 9.5 | 9.7 | 7.7 | 8.3 | 9.7 | 10.6 | 9.3 |
| 2 years | 10.3 | 10.0 | 10.6 | 10.6 | 10.5 | 9.4 | 9.9 | 10.6 | 11.3 | 10.1 |
| 5 years | 13.3 | 12.9 | 13.0 | 13.4 | 13.3 | 12.0 | 13.3 | 14.0 | 14.5 | 13.4 |
| 10 years | 16.2 | 16.8 | 16.3 | 16.0 | 16.0 | 14.7 | 16.2 | 16.6 | 17.2 | 16.1 |
| 15 years | 18.2 | 17.9 | 19.1 | 18.7 | 18.9 | 16.7 | 17.4 | 18.0 | 19.3 | 18.3 |
| 20 years | 19.6 | 20.2 | 21.4 | 20.2 | 20.3 | 17.8 | 18.4 | 18.7 | 20.7 | 19.4 |
| 25 years | 20.7 | 21.6 | 23.6 | 21.0 | 22.0 | 18.1 | 18.8 | 19.2 | 21.0 | 20.2 |
| 30 years | 20.9 | 21.9 | 24.4 | 21.1 | 22.3 | 18.4 | 18.9 | 19.5 | 21.0 | 20.3 |
| Companies Allowing Carryover of Days | 41% | 30% | 38% | 25% | 51% | 24% | 35% | 54% | 66% | 50% |
| **AVERAGE SICK DAYS** | | | | | | DAYS | | | | |
| **(According to Service)** | | | | | | | | | | |
| 1/2 year | 5.1 | 5.8 | 4.7 | 5.1 | 6.2 | 4.1 | 3.9 | 4.9 | 5.8 | 4.4 |
| 1 year | 10.0 | 13.3 | 10.4 | 9.2 | 11.0 | 6.9 | 7.4 | 8.6 | 13.5 | 8.8 |
| 2 years | 12.1 | 17.2 | 14.5 | 12.2 | 14.1 | 7.9 | 9.1 | 9.5 | 13.9 | 11.1 |
| 5 years | 18.2 | 22.3 | 31.7 | 20.3 | 23.9 | 10.6 | 10.8 | 11.0 | 19.1 | 17.7 |
| 10 years | 22.5 | 23.2 | n.a. | 27.3 | 33.6 | 11.4 | 10.7 | 13.5 | 24.1 | 20.6 |
| 15 years | 25.0 | 24.7 | n.a. | 29.1 | 39.0 | 13.1 | 11.3 | 13.6 | 25.6 | 21.7 |
| 20 years | 25.5 | 25.4 | n.a. | 29.2 | 41.6 | 14.8 | 11.7 | 13.7 | 27.0 | 23.9 |
| 25 years | 26.1 | 25.9 | n.a. | 30.5 | n.a. | n.a. | 12.1 | 13.8 | n.a. | 25.1 |
| 30 years | 26.9 | 26.4 | n.a. | 32.0 | n.a. | n.a. | 12.6 | 13.8 | n.a. | 26.2 |
| Companies Allowing Carryover of Days | 44% | 21% | 49% | 49% | 49% | 26% | 35% | 54% | 76% | 48% |
| **HOLIDAYS** | | | | | | PERCENT | | | | |
| Less than 6 | 4 | 2 | 0 | 1 | 3 | 10 | 8 | 4 | 0 | 2 |
| 6 days | 12 | 6 | 6 | 9 | 4 | 23 | 25 | 11 | 5 | 11 |
| 7 days | 14 | 12 | 8 | 14 | 15 | 19 | 16 | 20 | 9 | 16 |
| 8 days | 16 | 11 | 12 | 19 | 21 | 14 | 20 | 24 | 7 | 19 |
| 9 days | 16 | 20 | 22 | 19 | 27 | 12 | 10 | 13 | 17 | 9 |
| 10 days | 19 | 16 | 22 | 27 | 18 | 9 | 15 | 20 | 23 | 27 |
| 11 days | 12 | 20 | 16 | 8 | 6 | 10 | 5 | 5 | 19 | 13 |
| More than 11 | 7 | 13 | 14 | 3 | 6 | 3 | 1 | 3 | 20 | 3 |
| **PERSONAL — YES** | **42** | **33** | **50** | **50** | **46** | **32** | **42** | **43** | **58** | **38** |
| 1 day | 13 | 7 | 12 | 19 | 15 | 20 | 3 | 23 | 15 | 13 |
| 2 days | 27 | 14 | 4 | 22 | 37 | 28 | 39 | 17 | 34 | 29 |
| 3 days | 17 | 16 | 28 | 16 | 17 | 8 | 17 | 17 | 21 | 16 |
| 4 days | 6 | 3 | 16 | 6 | 11 | 3 | 4 | 3 | 6 | 5 |
| 5 or more | 9 | 11 | 0 | 12 | 5 | 11 | 6 | 11 | 6 | 18 |
| As needed | 28 | 49 | 40 | 25 | 15 | 30 | 31 | 29 | 18 | 19 |
| **FUNERAL** | | | | | | | | | | |
| **(Per Occurrence) — YES** | **85** | **90** | **84** | **89** | **94** | **81** | **80** | **82** | **72** | **87** |
| 1 day | 3 | 1 | 0 | 4 | 2 | 4 | 6 | 2 | 0 | 3 |
| 2 days | 8 | 7 | 14 | 7 | 4 | 11 | 12 | 10 | 6 | 6 |
| 3 days | 40 | 58 | 31 | 32 | 28 | 37 | 32 | 48 | 32 | 44 |
| 4 days | 1 | 1 | 5 | 5 | 1 | 1 | 1 | 1 | 1 | 0 |
| 5 or more | 3 | 1 | 2 | 0 | 4 | 2 | 4 | 3 | 9 | 5 |
| Varies by relation | 45 | 32 | 48 | 52 | 61 | 45 | 45 | 36 | 52 | 42 |
| **JURY DUTY** | | | | | | | | | | |
| Yes | 89 | 90 | 98 | 99 | 97 | 86 | 80 | 84 | 88 | 90 |
| **MILITARY LEAVE** | | | | | | | | | | |
| Yes | 53 | 53 | 66 | 66 | 65 | 45 | 40 | 44 | 53 | 55 |
| Percent of Payroll Represented By Paid Leave | 8 | 9 | 10 | 8 | 8 | 6 | 8 | 8 | 10 | 9 |

n.a. = Figure not available due to insufficient response

# Paid Leave — Company Size (By Employees)

| | TOTAL U.S. | 1-25 | 26-100 | 100-500 | 500-1,000 | OVER 1,000 |
|---|---|---|---|---|---|---|
| **AVERAGE VACATION DAYS (According to Service)** | | | | DAYS | | |
| 1/2 year | 3.8 | 3.3 | 4.0 | 3.7 | 3.8 | 4.0 |
| 1 year | 9.1 | 8.3 | 9.1 | 9.3 | 9.3 | 9.8 |
| 2 years | 10.3 | 9.9 | 10.1 | 10.5 | 10.2 | 10.5 |
| 5 years | 13.3 | 13.0 | 13.5 | 13.4 | 13.0 | 13.6 |
| 10 years | 16.2 | 15.5 | 16.2 | 16.8 | 15.7 | 16.4 |
| 15 years | 18.2 | 16.7 | 18.0 | 18.5 | 18.8 | 19.4 |
| 20 years | 19.6 | 17.4 | 19.1 | 20.2 | 20.8 | 20.9 |
| 25 years | 20.7 | 17.6 | 19.7 | 21.3 | 21.7 | 23.1 |
| 30 years | 20.9 | 17.7 | 19.7 | 21.5 | 22.3 | 23.6 |
| Companies Allowing Carryover of Days | 41% | 39% | 40% | 44% | 35% | 44% |
| **AVERAGE SICK DAYS (According to Service)** | | | | DAYS | | |
| 1/2 year | 5.1 | 3.6 | 4.5 | 5.5 | 5.9 | 6.8 |
| 1 year | 10.0 | 9.3 | 8.3 | 10.1 | 11.3 | 13.0 |
| 2 years | 12.1 | 8.9 | 9.9 | 12.4 | 14.3 | 18.1 |
| 5 years | 18.2 | 10.4 | 13.9 | 19.9 | 23.0 | 27.8 |
| 10 years | 22.5 | 10.9 | 16.2 | 26.3 | 30.3 | 34.3 |
| 15 years | 25.0 | 11.6 | 16.3 | 28.8 | 36.3 | 41.1 |
| 20 years | 25.5 | 11.7 | 16.4 | 28.9 | 43.2 | n.a. |
| 25 years | 26.1 | 11.9 | 17.0 | n.a. | n.a. | n.a. |
| 30 years | 26.9 | 12.1 | 17.5 | n.a. | n.a. | n.a. |
| Companies Allowing Carryover of Days | 44% | 37% | 45% | 48% | 44% | 45% |
| **HOLIDAYS** | | | | PERCENT | | |
| Less than 6 | 4 | 11 | 3 | 2 | 0 | 0 |
| 6 days | 12 | 23 | 12 | 7 | 7 | 7 |
| 7 days | 14 | 16 | 16 | 15 | 13 | 8 |
| 8 days | 16 | 17 | 17 | 16 | 12 | 15 |
| 9 days | 16 | 10 | 18 | 20 | 25 | 13 |
| 10 days | 19 | 14 | 17 | 21 | 22 | 22 |
| 11 days | 12 | 5 | 9 | 13 | 16 | 20 |
| More than 11 | 7 | 4 | 8 | 6 | 5 | 15 |
| **PERSONAL — YES** | **42** | **38** | **46** | **44** | **32** | **42** |
| 1 day | 13* | 10 | 16 | 14 | 12 | 9 |
| 2 days | 27 | 31 | 24 | 29 | 28 | 25 |
| 3 days | 17 | 17 | 19 | 16 | 20 | 18 |
| 4 days | 6 | 5 | 3 | 7 | 8 | 12 |
| 5 or more | 9 | 1 | 16 | 9 | 4 | 8 |
| As needed | 28 | 36 | 22 | 25 | 28 | 28 |
| **FUNERAL (Per Occurrence) — YES** | **85** | **77** | **82** | **90** | **90** | **87** |
| 1 day | 3 | 6 | 4 | 1 | 2 | 0 |
| 2 days | 8 | 15 | 7 | 7 | 4 | 3 |
| 3 days | 40 | 2* | 34 | 47 | 40 | 46 |
| 4 days | 1 | 2 | 0 | 1 | 4 | 1 |
| 5 or more | 3 | 3 | 4 | 3 | 3 | 4 |
| Varies by relation | 45 | 46 | 51 | 41 | 47 | 46 |
| **JURY DUTY** | | | | | | |
| Yes | 89 | 78 | 87 | 94 | 95 | 94 |
| **MILITARY LEAVE** | | | | | | |
| Yes | 53 | 32 | 43 | 63 | 62 | 72 |
| Percent of Payroll Represented By Paid Leave | 8 | 8 | 8 | 9 | 9 | 10 |

n.a. = Figure not available due to insufficient response

# Paid Leave — Region

| | TOTAL U.S. | NORTHEAST | GREAT LAKES | SOUTH | MIDWEST | WEST | TOTAL CANADA |
|---|---|---|---|---|---|---|---|
| **AVERAGE VACATION DAYS (According to Service)** | | | | DAYS | | | |
| 1/2 year | 3.8 | 4.1 | 3.6 | 3.7 | 3.3 | 4.4 | 5.1 |
| 1 year | 9.1 | 9.2 | 9.1 | 9.1 | 8.8 | 9.8 | 11.3 |
| 2 years | 10.3 | 10.3 | 10.1 | 10.2 | 10.3 | 10.5 | 11.9 |
| 5 years | 13.3 | 13.8 | 13.1 | 13.3 | 12.8 | 13.5 | 15.4 |
| 10 years | 16.2 | 16.3 | 16.1 | 15.8 | 15.8 | 18.2 | 18.8 |
| 15 years | 18.2 | 18.5 | 18.0 | 17.8 | 18.3 | 18.6 | 20.4 |
| 20 years | 19.6 | 19.9 | 19.9 | 19.2 | 19.4 | 19.4 | 22.8 |
| 25 years | 20.7 | 21.0 | 21.0 | 20.0 | 20.7 | 20.2 | 24.6 |
| 30 years | 20.9 | 21.1 | 21.1 | 20.4 | 20.9 | 20.3 | 25.4 |
| Companies Allowing Carryover of Days | 41% | 41% | 35% | 37% | 45% | 56% | 42% |
| **AVERAGE SICK DAYS (According to Service)** | | | | DAYS | | | |
| 1/2 year | 5.1 | 4.9 | 4.7 | 5.5 | 5.2 | 5.4 | 6.6 |
| 1 year | 10.0 | 8.8 | 9.9 | 9.9 | 11.0 | 11.5 | 12.5 |
| 2 years | 12.1 | 11.1 | 12.5 | 12.9 | 11.4 | 13.7 | 14.8 |
| 5 years | 18.2 | 16.5 | 19.2 | 19.7 | 16.8 | 19.6 | 19.6 |
| 10 years | 22.5 | 19.2 | 23.6 | 26.0 | 23.2 | 20.9 | 26.3 |
| 15 years | 25.0 | 22.1 | 26.2 | 28.4 | 26.6 | 21.0 | 27.7 |
| 20 years | 25.5 | 24.7 | 26.4 | n.a. | 27.9 | n.a. | 29.5 |
| 25 years | 26.1 | n.a. | n.a. | n.a. | n.a. | n.a. | 29.6 |
| 30 years | 26.9 | n.a. | n.a. | n.a. | n.a. | n.a. | 29.8 |
| Companies Allowing Carryover of Days | 44% | 37% | 39% | 49% | 49% | 53% | 24% |
| **HOLIDAYS** | | | | PERCENT | | | |
| Less than 6 | 4 | 3 | 4 | 4 | 6 | 0 | 2 |
| 6 days | 12 | 9 | 11 | 15 | 14 | 10 | 2 |
| 7 days | 14 | 10 | 17 | 16 | 16 | 10 | 4 |
| 8 days | 16 | 11 | 15 | 21 | 17 | 20 | 5 |
| 9 days | 16 | 17 | 17 | 16 | 17 | 16 | 16 |
| 10 days | 19 | 19 | 18 | 16 | 17 | 26 | 21 |
| 11 days | 12 | 21 | 8 | 7 | 8 | 14 | 32 |
| More than 11 | 7 | 10 | 10 | 5 | 5 | 4 | 18 |
| **PERSONAL — YES** | **42** | **46** | **44** | **41** | **41** | **35** | **31** |
| 1 day | 13 | 10 | 12 | 13 | 14 | 16 | 3 |
| 2 days | 27 | 42 | 22 | 22 | 23 | 19 | 7 |
| 3 days | 17 | 18 | 20 | 13 | 14 | 22 | 4 |
| 4 days | 6 | 7 | 8 | 4 | 9 | 0 | 4 |
| 5 or more | 9 | 2 | 11 | 16 | 8 | 11 | 19 |
| As needed | 28 | 21 | 27 | 32 | 32 | 32 | 63 |
| **FUNERAL (Per Occurrence) — YES** | **85** | **90** | **86** | **78** | **90** | **75** | **90** |
| 1 day | 3 | 3 | 1 | 1 | 3 | 5 | 3 |
| 2 days | 8 | 7 | 7 | 13 | 7 | 6 | 3 |
| 3 days | 40 | 42 | 37 | 40 | 36 | 43 | 38 |
| 4 days | 1 | 1 | 1 | 1 | 2 | 3 | 1 |
| 5 or more | 3 | 3 | 5 | 2 | 2 | 8 | 4 |
| Varies by relation | 45 | 44 | 49 | 43 | 50 | 35 | 51 |
| **JURY DUTY** | | | | | | | |
| Yes | 89 | 90 | 91 | 90 | 88 | 80 | 90 |
| **MILITARY LEAVE** | | | | | | | |
| Yes | 53 | 60 | 47 | 51 | 55 | 45 | 6 |
| Percent of Payroll Represented By Paid Leave | 8 | 9 | 8 | 8 | 8 | 8 | 7 |

n.a. = Figure not available due to insufficient response

# Supplementary Benefits

## Type of Business

PERCENT

| | TOTAL U.S. | MANU./ PROC./ CONST. | UTIL./ TRANS./ COMM. | BANK./ FIN. | INS. | RET./ WHOLE. | SERV. | PROF. | EDUC./ GOV'T./ NON. | OTHER |
|---|---|---|---|---|---|---|---|---|---|---|
| 401(k) Plan | 48 | 55 | 70 | 55 | 60 | 46 | 33 | 42 | 31 | 55 |
| Savings/Thrift | 26 | 37 | 42 | 28 | 29 | 19 | 17 | 17 | 24 | 27 |
| Profit Sharing | 33 | 47 | 18 | 31 | 33 | 43 | 38 | 28 | 4 | 32 |
| Stock Ownership | 16 | 22 | 42 | 19 | 20 | 12 | 18 | 7 | 1 | 12 |
| Holiday/Year-End Bonus | 38 | 35 | 30 | 38 | 39 | 58 | 47 | 37 | 14 | 39 |
| Percent of Payroll for Supplementary Benefits | 7 | 7 | 7 | 6 | 6 | 6 | 6 | 5 | 9 | 8 |

## Company Size (By Employees)

PERCENT

| | U.S. | 1-25 | 26-100 | 100-500 | 500-1,000 | OVER 1,000 |
|---|---|---|---|---|---|---|
| 401(k) Plan | 48 | 17 | 47 | 56 | 65 | 73 |
| Savings/Thrift | 26 | 9 | 23 | 32 | 31 | 45 |
| Profit Sharing | 33 | 30 | 37 | 34 | 37 | 26 |
| Stock Ownership | 16 | 7 | 14 | 17 | 17 | 30 |
| Holiday/Year-End Bonus | 38 | 49 | 44 | 37 | 32 | 16 |
| Percent of Payroll for Supplementary Benefits | 7 | 6 | 7 | 7 | 7 | 6 |

## Region

PERCENT

| | U.S. | NORTHEAST | GREAT LAKES | SOUTH | MIDWEST | WEST | TOTAL CANADA |
|---|---|---|---|---|---|---|---|
| 401(k) Plan | 48 | 46 | 48 | 49 | 49 | 51 | — |
| Savings/Thrift | 26 | 26 | 25 | 33 | 21 | 27 | 17 |
| Profit Sharing | 33 | 35 | 33 | 29 | 35 | 29 | 20 |
| Stock Ownership | 16 | 13 | 12 | 20 | 21 | 15 | 17 |
| Holiday/Year-End Bonus | 38 | 39 | 39 | 40 | 37 | 30 | 30 |
| Percent of Payroll for Supplementary Benefits | 7 | 7 | 7 | 6 | 6 | 8 | 4 |

# AMS Survey Reports

**1988 AMS Office Benefits Survey** — reports degree of company benefits offerings by industy, region and company size re: medical, disability, dental, optical, life and pension plans; paid leave policies (vacation, sick, holiday, etc.); and supplementary plans (401k, savings, ESOP, etc.). Also reports benefits expense as percent of payroll.
*Price: $30 ($15 to AMS members)*

**1988 AMS Office Turnover Survey** — presents exempt and nonexempt turnover rates and reasons for termination by type of business, region and company size.
*Price: $30 ($15 to AMS members)*

**1988-89 AMS Business Expenses Survey** — examines company policies for reimbursing business travel, education, and relocation expenses. Responses are broken down by company size and industry; compared with previous surveys.
*Price: $15 ($10 to AMS members)*

**1988-89 AMS Hiring & Firing Policies Survey** — covers company hiring practices, how they evaluate potential employees, including intelligence/personality testing. Also examines progressive discipline policies, severance pay, and the prevalence of unjust discharge suits. Results reported by company size and industry; compared with previous surveys.
*Price: $15 ($10 to AMS members)*

**1988 AMS Smoking Policies Survey** — covers how many companies have smoking policies in effect, where smoking is banned, hiring policies regarding smokers, "kick the habit" programs. Includes sample company smoking policy. Results reported by industry and company size; compared with 1987 survey.
*Price: $15 ($10 to AMS members)*

**1988 AMS New Benefits Survey** — four-part survey report covering four nontraditional benefits programs: flexible benefits; employee assistance (EAPs); wellness/physical fitness; and childcare. Each category is broken down into types of services covered. Reports statistics by region, company size, and industry; compared with 1987 survey.
*Price: $15 ($10 to AMS members)*

**1988 AMS Contract Labor Survey** — three-part survey covers trends in temporary help; contract staffing; and part-time employment. Gauges use and reasons for using temp help; prevalence of contract staffing; benefits offered to part-timers; more. Each category broken down by industry, company size, and region; compared with 1987 survey.
*Price: $15 ($10 to AMS members)*

**1988 AMS Flexible Work Survey** — covers trends in three major areas of work schedules: flextime; job sharing; and workweeks. Each category is broken down by region, company size, and industry; compared with 1987 survey.
*Price: $15 ($10 to AMS members)*

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**Ordering:** Send check, payable to "AMS", or MasterCard, VISA, Diners Club or American Express card number and expiration date to Order Dept., AMS, 4622 Street Road, Trevose, PA 19047; or call 215-953-1040. There is an additional shipping and handling charge of $3.50 for orders that are invoiced or charged.

## ACTIVE U.S. AIRMAN CERTIFICATES HELD

As of December 31, 1983-1987

| | 1983 | 1984 | 1985 | 1986 | 1987 |
|---|---|---|---|---|---|
| **Pilots—TOTAL** | 718,004 | 722,376 | 709,540 | 709,118 | 699,653 |
| Students | 147,197 | 150,081 | 146,652 | 150,273 | 146,016 |
| Private | 318,643 | 320,086 | 311,086 | 305,736 | 300,949 |
| Commercial | 159,495 | 155,929 | 151,632 | 147,798 | 143,645 |
| Airline Transport | 75,938 | 79,192 | 82,740 | 87,186 | 91,287 |
| Helicopter (only) | 7,237 | 7,532 | 8,123 | 8,581 | 8,702 |
| Glider (only)[a] | 8,157 | 8,390 | 8,168 | 8,411 | 7,901 |
| Lighter-Than-Air[a] | 1,337 | 1,166 | 1,139 | 1,133 | 1,153 |
| **Non-Pilots—TOTAL** | 432,890 | 447,462 | 412,741 | 410,079 | 427,962 |
| Mechanics[b] | 288,335 | 298,028 | 274,100 | 284,241 | 297,178 |
| Parachute Rigger[c] | 10,074 | 10,194 | 9,395 | 9,535 | 9,659 |
| Ground Instructor[d] | 66,385 | 67,463 | 58,214 | 59,443 | 60,861 |
| Dispatcher[e] | 8,223 | 8,980 | 8,511 | 9,025 | 9,491 |
| Flight Navigator | 1,636 | 1,603 | 1,542 | 1,512 | 1,445 |
| Flight Engineer | 38,546 | 40,534 | 43,377 | 46,323 | 49,328 |
| **Flight Instructor Certificates** | 62,201 | 61,173 | 58,940 | 57,355 | 60,316 |
| **Instrument Ratings** | 254,271 | 256,584 | 258,559 | 262,388 | 266,122 |

Source: Federal Aviation Administration, FAA Statistical Handbook of Aviation, (Annually).

a Glider and lighter-than-air pilots are not required to have a medical examination; however, the totals above are the number who have had a medical.

b No pertinent medical examination required; therefore, no determination as to current activity can be made.

c Senior rigger holds all ratings; lesser ratings shown not additional certificates.

# Helicopter Transportation

In 1987, there were 3,760 heliports/helipads in the United States, according to the *1988 Helicopter Annual* published by the Helicopter Association International. The number represents an increase of 435 facilities over the prior year's total.

More than 95 percent of the helicopter landing areas were private facilities. HAI provided a breakdown that showed 3,579 private heliports/helipads and 181 public use facilities. Only 92 of the landing areas, or 2.4 percent, were located at airports.

The figures are not directly comparable to HAI's 1986 listings because the latter included Puerto Rico and the U.S. Virgin Islands. The 1986 figures were 3,158 private, 182 public facilities with 97 of the landing areas (2.9 percent) at airports.

With 406 heliports/helipads, Texas topped the list of states in number of facilities in operation during 1987; Texas' total was up 28 units from the figure in HAI's 1986 survey. In second place was California with 363 heliports/helipads, up 44 from 1986, and Pennsylvania ranked third with 247, up 20. The top three states also led the 1986 survey in the same order.

Rounding out the top 10 for 1987 were: Illinois (198), New Jersey and Ohio (both 186), Louisiana (175), Florida (169), New York (124) and Colorado (113).

The *1988 Helicopter Annual* also provided a summary of owner/operators of heliports/helipads in the United States. HAI's data showed 3,909 owners/operators, more than 400 above the prior year's total. Corporate owner/operators represented the largest single category with 1,591 facilties, 37 percent of the total; the number compared with 1,319 in 1986. Hospital facilities totaled 1,123 or 25.8 percent, up from 937 in 1986.

Other figures in the 1987 owner/operator breakdown by type of organization were: government (519), individuals (352), military (139), oil companies (107), and hotels (78).

Within the corporate category, the owner/operator breakdown by states followed a top-10 pattern similar to that of facilities: Texas placed first with [illegible]4 corporate owner/operators, followed by California (163), Pennsyl-

vania (129), New Jersey (122), Louisiana (107), Florida (75), New York (67), Ohio (61), Illinois (60) and Colorado (49).

In the hospital breakdown, however, Illinois was top ranked with 88 owners/operators, followed by Texas (84), California (78), Ohio (62), Florida (56), then Oklahoma (47), which did not appear in the corporate or facilities top-10 listings. Rounding out the hospital top 10 were Louisiana and Missouri (both 46), Colorado (36), Virginia (33) and Washington (30). □

## OPERATORS/OWNERS OF HELIPADS IN THE UNITED STATES

By State
As of 1987

| State | HOSPITAL public | HOSPITAL private | Military | Government | Oil | Hotels | Corporate | Individual |
|---|---|---|---|---|---|---|---|---|
| Alaska | 3 | 1 | 2 | 16 | 4 | 0 | 6 | 1 |
| Alabama | 0 | 16 | 6 | 5 | 0 | 0 | 12 | 5 |
| Arkansas | 0 | 12 | 1 | 2 | 0 | 0 | 0 | 3 |
| Arizona | 0 | 29 | 1 | 8 | 0 | 2 | 42 | 5 |
| California | 1 | 77 | 10 | 93 | 18 | 9 | 163 | 12 |
| Colorado | 1 | 35 | 1 | 21 | 4 | 3 | 49 | 4 |
| Connecticut | 0 | 9 | 0 | 1 | 0 | 1 | 43 | 2 |
| Washington, D.C. | 0 | 2 | 4 | 7 | 2 | 0 | 4 | 0 |
| Delaware | 0 | 0 | 0 | 3 | 0 | 0 | 10 | 1 |
| Florida | 0 | 56 | 2 | 21 | 0 | 5 | 75 | 15 |
| Georgia | 0 | 28 | 5 | 15 | 0 | 4 | 20 | 4 |
| Hawaii | 0 | 6 | 1 | 10 | 0 | 2 | 4 | 3 |
| Idaho | 0 | 9 | 2 | 5 | 0 | 0 | 3 | 3 |
| Illinois | 0 | 88 | 2 | 27 | 1 | 4 | 60 | 15 |
| Indiana | 0 | 22 | 5 | 10 | 0 | 2 | 32 | 16 |
| Iowa | 0 | 28 | 4 | 4 | 0 | 1 | 4 | 3 |
| Kansas | 0 | 14 | 0 | 5 | 0 | 0 | 3 | 3 |
| Kentucky | 0 | 10 | 1 | 2 | 0 | 2 | 8 | 3 |
| Louisiana | 1 | 45 | 2 | 18 | 53 | 3 | 107 | 2 |
| Maine | 0 | 3 | 0 | 2 | 0 | 0 | 4 | 0 |
| Maryland | 0 | 16 | 2 | 5 | 0 | 1 | 11 | 7 |
| Massachusetts | 0 | 11 | 8 | 3 | 0 | 1 | 36 | 11 |
| Michigan | 0 | 17 | 1 | 6 | 0 | 2 | 30 | 12 |
| Minnesota | 0 | 9 | 0 | 3 | 0 | 0 | 8 | 7 |
| Mississippi | 0 | 11 | 0 | 7 | 0 | 0 | 1 | 4 |
| Missouri | 1 | 45 | 2 | 5 | 0 | 3 | 17 | 12 |
| Montana | 0 | 12 | 1 | 1 | 0 | 0 | 3 | 2 |
| Nebraska | 0 | 13 | 1 | 1 | 0 | 0 | 2 | 4 |
| Nevada | 0 | 1 | 1 | 9 | 0 | 5 | 8 | 0 |
| New Hampshire | 0 | 1 | 0 | 0 | 0 | 0 | 15 | 3 |
| New Jersey | 0 | 15 | 7 | 42 | 1 | 3 | 122 | 17 |
| New Mexico | 0 | 7 | 0 | 5 | 0 | 1 | 4 | 0 |
| New York | 0 | 25 | 4 | 21 | 0 | 0 | 67 | 8 |
| North Carolina | 0 | 18 | 8 | 6 | 0 | 0 | 11 | 2 |

(Continued on next page)

## OPERATORS/OWNERS OF HELIPADS IN THE UNITED STATES (Continued)

By State
As of 1987

| State | HOSPITAL public | HOSPITAL private | Military | Government | Oil | Hotels | Corporate | Individual |
|---|---|---|---|---|---|---|---|---|
| North Dakota | 0 | 1 | 1 | 1 | 0 | 0 | 1 | 2 |
| Ohio | 1 | 61 | 1 | 28 | 0 | 7 | 61 | 26 |
| Oklahoma | 1 | 46 | 5 | 7 | 0 | 3 | 22 | 2 |
| Oregon | 0 | 30 | 3 | 5 | 0 | 0 | 34 | 8 |
| Pennsylvania | 0 | 68 | 7 | 9 | 0 | 4 | 129 | 34 |
| Rhode Island | 0 | 5 | 0 | 4 | 0 | 0 | 1 | 1 |
| South Carolina | 0 | 8 | 3 | 0 | 0 | 0 | 8 | 0 |
| South Dakota | 0 | 2 | 0 | 1 | 0 | 0 | 4 | 0 |
| Tennessee | 0 | 17 | 2 | 5 | 0 | 1 | 22 | 5 |
| Texas | 2 | 82 | 7 | 33 | 24 | 6 | 224 | 52 |
| Utah | 0 | 12 | 1 | 7 | 0 | 1 | 8 | 3 |
| Virginia | 0 | 33 | 7 | 18 | 0 | 0 | 31 | 4 |
| Vermont | 1 | 0 | 9 | 0 | 0 | 0 | 2 | 2 |
| Washington | 0 | 30 | 6 | 6 | 0 | 2 | 35 | 16 |
| Wisconsin | 0 | 12 | 1 | 3 | 0 | 0 | 7 | 6 |
| West Virginia | 0 | 8 | 0 | 1 | 0 | 0 | 14 | 2 |
| Wyoming | 0 | 5 | 2 | 2 | 0 | 0 | 4 | 0 |
| **Totals** | 12 | 1111 | 139 | 519 | 107 | 78 | 1591 | 352 |

Source: Helicopter Association International, *1988 Helicopter Annual*.
NOTE: Corporate operator-owners control 42.3 percent of all helicopter landing areas; government 13.8 percent; individuals 9.3 percent; oil companies 2.8 percent; and hotels 2.1 percent.

## HELIPORTS/HELIPADS[a] IN THE UNITED STATES

By State
As of 1987

| State | Total of heliports in state | Private Use | | Public Use | |
|---|---|---|---|---|---|
| | | Heliports | Heliports at Airports | Heliports | Airports |
| Alaska | 27 | 14 | 3 | 8 | 2 |
| Alabama | 44 | 42 | 0 | 1 | 1 |
| Arkansas | 18 | 16 | 1 | 0 | 1 |
| Arizona | 88 | 86 | 1 | 0 | 1 |
| California | 363 | 338 | 1 | 3 | 21 |
| Colorado | 113 | 108 | 0 | 1 | 4 |
| Connecticut | 59 | 55 | 1 | 2 | 1 |
| District of Columbia | 19 | 17 | 0 | 0 | 2 |
| Delaware | 15 | 14 | 0 | 1 | 0 |
| Florida | 169 | 168 | 0 | 1 | 0 |
| Georgia | 77 | 76 | 0 | 0 | 1 |
| Hawaii | 22 | 18 | 0 | 1 | 3 |
| Idaho | 22 | 22 | 0 | 0 | 0 |
| Illinois | 198 | 189 | 3 | 5 | 1 |
| Indiana | 90 | 84 | 2 | 3 | 1 |
| Iowa | 44 | 43 | 0 | 0 | 1 |
| Kansas | 26 | 23 | 0 | 0 | 3 |
| Kentucky | 27 | 27 | 0 | 0 | 0 |
| Louisiana | 175 | 168 | 2 | 5 | 0 |
| Maine | 9 | 8 | 0 | 1 | 0 |
| Maryland | 47 | 45 | 2 | 0 | 0 |
| Massachusetts | 72 | 68 | 0 | 2 | 2 |
| Michigan | 63 | 59 | 1 | 3 | 0 |
| Minnesota | 24 | 21 | 1 | 0 | 2 |
| Mississippi | 21 | 21 | 0 | 0 | 0 |
| Missouri | 84 | 77 | 2 | 3 | 2 |
| Montana | 19 | 18 | 0 | 1 | 0 |
| Nebraska | 21 | 21 | 0 | 0 | 0 |
| Nevada | 28 | 27 | 0 | 1 | 0 |
| New Hampshire | 21 | 19 | 0 | 1 | 1 |
| New Jersey | 186 | 181 | 0 | 5 | 0 |
| New Mexico | 15 | 14 | 0 | 1 | 0 |

(Continued on next page)

## HELIPORTS/HELIPADS[a] IN THE UNITED STATES (Continued)

By State
As of 1987

| State | Total of heliports in state | Private Use | | Public Use | |
|---|---|---|---|---|---|
| | | Heliports | Heliports at Airports | Heliports | Airports |
| New York | 124 | 112 | 0 | 10 | 2 |
| North Carolina | 46 | 44 | 1 | 1 | 0 |
| North Dakota | 6 | 6 | 0 | 0 | 0 |
| Ohio | 186 | 161 | 1 | 21 | 3 |
| Oklahoma | 84 | 80 | 0 | 4 | 0 |
| Oregon | 79 | 74 | 2 | 3 | 0 |
| Pennsylvania | 247 | 236 | 1 | 10 | 0 |
| Rhode Island | 10 | 9 | 0 | 1 | 0 |
| South Carolina | 18 | 18 | 0 | 0 | 0 |
| South Dakota | 7 | 7 | 0 | 0 | 0 |
| Tennessee | 52 | 47 | 1 | 3 | 1 |
| Texas | 406 | 394 | 1 | 10 | 1 |
| Utah | 29 | 27 | 0 | 0 | 2 |
| Virginia | 87 | 82 | 0 | 3 | 2 |
| Vermont | 14 | 13 | 0 | 1 | 0 |
| Washington | 95 | 91 | 1 | 1 | 2 |
| Wisconsin | 27 | 27 | 0 | 0 | 0 |
| West Virginia | 25 | 25 | 0 | 0 | 0 |
| Wyoming | 12 | 11 | 0 | 0 | 1 |
| Total U.S. | 3760 | 3551 | 28 | 117 | 64 |

Source: Helicopter Association International, 1988 Helicopter Annual.
NOTE: 95.2 percent of all U.S. helicopter landing areas are private, while 4.8 percent are public. 29.9 percent of all U.S. helicopter landing areas are at hospitals, 2.4 percent are located at airports.
a: Excludes temporary heliports, offshore heliports or infrequently used helicopter landing sites.

## CIVIL HELICOPTER FLEET
## UNITED STATES, CANADA, MEXICO AND PUERTO RICO

1985°

| State | OPERATORS | | | | HELICOPTERS | | | |
|---|---|---|---|---|---|---|---|---|
| | TOTAL | Commercial | Corp. and Exec. | Civil Gov't. | TOTAL | Commercial | Corp. and Exec | Civil Gov't. |
| Alabama | 34 | 12 | 16 | 6 | 91 | 38 | 23 | 30 |
| Alaska | 51 | 34 | 13 | 4 | 280 | 256 | 16 | 8 |
| Arizona | 60 | 34 | 19 | 7 | 183 | 139 | 22 | 22 |
| Arkansas | 16 | 9 | 6 | 1 | 42 | 34 | 7 | 1 |
| California | 277 | 140 | 96 | 41 | 846 | 495 | 170 | 181 |
| Colorado | 64 | 25 | 34 | 5 | 156 | 94 | 47 | 15 |
| Connecticut | 26 | 10 | 16 | — | 59 | 38 | 21 | — |
| Delaware | 6 | — | 5 | 1 | 6 | — | 5 | 1 |
| Dist. of Col. | 7 | 1 | — | 6 | 31 | 3 | — | 28 |
| Florida | 169 | 75 | 60 | 34 | 292 | 239 | 65 | 88 |
| Georgia | 39 | 13 | 14 | 12 | 99 | 47 | 17 | 35 |
| Hawaii | 24 | 20 | 3 | 1 | 56 | 52 | 3 | 1 |
| Idaho | 38 | 20 | 15 | 3 | 80 | 55 | 20 | 5 |
| Illinois | 46 | 21 | 19 | 6 | 115 | 67 | 29 | 19 |
| Indiana | 42 | 18 | 17 | 7 | 109 | 62 | 33 | 15 |
| Iowa | 18 | 8 | 5 | 5 | 35 | 15 | 6 | 14 |
| Kansas | 19 | 12 | 4 | 3 | 36 | 23 | 6 | 7 |
| Kentucky | 37 | 8 | 27 | 2 | 57 | 21 | 32 | 4 |
| Louisiana | 46 | 22 | 17 | 7 | 699 | 632 | 54 | 13 |
| Maine | 8 | 4 | 3 | 1 | 21 | 12 | 4 | 5 |
| Maryland | 17 | 8 | 7 | 2 | 61 | 39 | 7 | 15 |
| Massachusetts | 24 | 10 | 12 | 2 | 63 | 42 | 19 | 2 |
| Michigan | 41 | 18 | 18 | 5 | 87 | 44 | 23 | 20 |
| Minnesota | 27 | 19 | 7 | 1 | 62 | 51 | 8 | 3 |
| Mississippi | 11 | 2 | 5 | 4 | 19 | 8 | 5 | 6 |
| Missouri | 29 | 13 | 12 | 4 | 71 | 48 | 12 | 11 |
| Montana | 24 | 14 | 5 | 5 | 48 | 33 | 6 | 9 |
| Nebraska | 15 | 7 | 6 | 2 | 31 | 15 | 7 | 9 |
| Nevada | 16 | 7 | 5 | 4 | 40 | 22 | 12 | 6 |
| New Hampshire | 17 | 9 | 8 | — | 40 | 30 | 10 | — |
| New Jersey | 54 | 21 | 27 | 6 | 151 | 99 | 38 | 14 |
| New Mexico | 12 | 5 | 5 | 2 | 24 | 12 | 7 | 5 |

(Continued on next page)

## CIVIL HELICOPTER FLEET
## UNITED STATES, CANADA, MEXICO AND PUERTO RICO (Continued)

1985[a]

| State | OPERATORS | | | | HELICOPTERS | | | |
|---|---|---|---|---|---|---|---|---|
| | TOTAL | Commercial | Corp. and Exec. | Civil Gov't. | TOTAL | Commercial | Corp. and Exec. | Civil Gov't. |
| New York | 77 | 27 | 41 | 9 | 198 | 98 | 72 | 28 |
| North Carolina | 19 | 7 | 8 | 4 | 37 | 14 | 14 | 9 |
| North Dakota | 17 | 12 | 4 | 1 | 39 | 31 | 5 | 3 |
| Ohio | 72 | 30 | 37 | 5 | 116 | 71 | 37 | 8 |
| Oklahoma | 36 | 21 | 13 | 2 | 125 | 107 | 13 | 5 |
| Oregon | 76 | 40 | 35 | 1 | 322 | 271 | 45 | 6 |
| Pennsylvania | 100 | 35 | 64 | 1 | 238 | 126 | 105 | 7 |
| Rhode Island | 6 | 2 | 3 | 1 | 7 | 2 | 4 | 1 |
| South Carolina | 23 | 12 | 7 | 4 | 59 | 46 | 7 | 6 |
| South Dakota | 5 | 4 | — | 1 | 9 | 8 | — | 1 |
| Tennessee | 31 | 12 | 15 | 4 | 69 | 33 | 17 | 19 |
| Texas | 217 | 72 | 132 | 13 | 548 | 259 | 244 | 45 |
| Utah | 26 | 17 | 8 | 1 | 130 | 116 | 13 | 1 |
| Vermont | 4 | 1 | 3 | — | 5 | 2 | 3 | — |
| Virginia | 36 | 10 | 19 | 7 | 64 | 25 | 24 | 15 |
| Washington | 86 | 50 | 29 | 7 | 208 | 148 | 43 | 17 |
| West Virginia | 39 | 7 | 29 | 3 | 48 | 11 | 30 | 7 |
| Wisconsin | 12 | 10 | 2 | — | 51 | 49 | 2 | — |
| Wyoming | 19 | 12 | 7 | — | 37 | 29 | 8 | — |
| Puerto Rico | 6 | 1 | 2 | 3 | 11 | 2 | 2 | 7 |
| **U.S. Total** | 2,221 | 1,002 | 963 | 256 | 6,412 | 4,244 | 1,391 | 777 |
| Canada | 217 | 125 | 75 | 17 | 1,236 | 1,008 | 131 | 97 |
| Mexico | 43 | 9 | 13 | 21 | 256 | 18 | 30 | 208 |
| **TOTAL** | 2,481 | 1,136 | 1,051 | 294 | 7,904 | 5,270 | 1,552 | 1,082 |

Source: Aerospace Industries Association, Directory of Helicopter Operators in the United States,Canada, Mexico and Puerto Rico, 1985-86.

# Research and Development

In 1987, total U.S. funding for research and development reached an all-time high of $123 billion, according to data supplied by the National Science Foundation (NSF).

The figure includes R&D work performed by industry, government agencies, colleges and universities, federally-funded R&D centers and non-profit institutions. It represents an increase of more than seven percent over 1986's $114.7 billion.

Using dollar value as a yardstick, industry performed some 72 percent of the nation's R&D, government agencies approximately 13 percent, colleges and universities nine percent. In terms of funding, industry financed $58.6 billion or 48 percent of the total, the federal government $60.4 billion or more than 49 percent.

For 1988, NSF expected total R&D expenditures to increase by another seven percent to $131.6 billion. The projection indicates that industrially-performed work, at $96 billion, will again account for almost three-quarters of all U.S. R&D. The government/industry funding ratio is expected to be about the same as in 1987.

In a related projection for 1988, data compiled by Battelle Memorial Institute also estimates industrial R&D at $96 billion, with the aerospace industry as leading R&D performer, as has been customary in the 1980s. Battelle estimates that the aerospace industry will conduct R&D worth $24.0 billion in federal and industry funds. Second place in the Battelle projection goes to the electrical machine/communications industry at $20.4 billion, followed by non-electrical machinery ($11.9 billion); chemicals ($9.6 billion) and autos, trucks and transportation equipment ($9.2 billion). The top five industries held the same relative positions in 1987.

DoD is by far the largest conductor of government-funded R&D, with FY 1988 outlays that represented more than 62 percent of the total. Within DoD, the USAF continues to lead the other services in terms of outlays for RDT&E. In FY 1988, USAF outlays amounted to $12.9 billion, or almost 40 percent of the DoD total. The Navy, at $8.3 billion was second. Army outlays totaled $4.5 billion and all other DoD agencies combined expended $7.3 billion.

DoD total outlays for RDT&E in FY 1988

($33.1 billion) fell below those of the preceding year ($33.6 billion), reflecting the sharp reductions in the Administration's budget imposed by the Congress. For FY 1989, DoD projected a rebound to $36.3 billion, but the Congress similarly cut the overall DoD budget; the final RDT&E figure was not available at publication time.

A breakdown of contractor-performed defense RDT&E for FY 1987 showed that the Pacific region, perennial leader, again topped the list of prime contract awards and increased its margin of leadership. The Pacific area won contracts—including industry, college and university and other performers—worth $7.7 billion or more than 36 percent of the total. Rounding out the top five regions were South Atlantic ($2.7 billion, 12.7 percent); New England (just under $2.7 billion, 12.6 percent); Middle Atlantic ($2.5 billion, 11.8 percent); and the Mountain region ($2.4 billion, 11.2 percent).

NSF's annual survey of industry expenditures for R&D showed that the aerospace industry continues to exceed the mean for all U.S. manufacturing industries when R&D funding is measured as a percentage of sales. In 1986, the latest year for which such information is available, aerospace funding for R&D (exclusive of government contractual funding) amounted to 4.0 percent of net sales, compared with a 3.1 percent average for all manufacturing industries. When company and government funds combined, the aerospace lead widened significantly: 15.7 percent compared with the all-industry average of 4.7 percent. □

## FUNDS FOR INDUSTRIAL RESEARCH AND DEVELOPMENT ALL INDUSTRIES AND THE AEROSPACE INDUSTRY

By Funding Source Calendar Years 1972-1986
(Millions of Dollars)

| Year | All Industries[a] | | | Aerospace Industry[b] | | |
|---|---|---|---|---|---|---|
| | Total | Federal Funds | Company Funds[c] | Total | Federal Funds | Company Funds[c] |
| CURRENT DOLLARS | | | | | | |
| 1972 | $19,552 | $ 8,017 | $11,535 | $ 4,950 | $ 3,970 | $ 978 |
| 1973 | 21,249 | 8,145 | 13,104 | 5,052 | 3,899 | 1,154 |
| 1974 | 22,887 | 8,220 | 14,667 | 5,278 | 4,000 | 1,278 |
| 1975 | 24,187 | 8,605 | 15,582 | 5,713 | 4,428 | 1,285 |
| 1976 | 26,997 | 9,561 | 17,436 | 6,339 | 4,921 | 1,418 |
| 1977 | 29,825 | 10,485 | 19,340 | 7,033 | 5,486 | 1,547 |
| 1978 | 33,304 | 11,189 | 22,115 | 7,536 | 5,713 | 1,823 |
| 1979 | 38,226 | 12,518 | 25,708 | 8,041 | 5,840 | 2,201 |
| 1980 | 44,505 | 14,029 | 30,476 | 9,198 | 6,628 | 2,570 |
| 1981 | 51,810 | 16,382 | 35,428 | 11,968 | 8,528 | 3,440 |
| 1982 | 57,995 | 18,483 | 39,512 | 13,658 | 9,776 | 3,882 |
| 1983 | 63,403 | 20,542 | 42,861 | 13,853 | 10,405 | 3,448 |
| 1984 | 71,470 | 23,162 | 48,308 | 16,033 | 12,228 | 3,804 |
| 1985[r] | 78,776 | 26,830 | 51,947 | 17,918 | 13,726 | 4,192 |
| 1986[r] | 80,629 | 27,782 | 52,847 | 16,240 | 12,099 | 4,141 |
| CONSTANT DOLLARS (1982 100)[d] | | | | | | |
| 1972 | $42,056 | $17,244 | $24,812 | $10,645 | $ 8,538 | $2,103 |
| 1973 | 42,893 | 16,441 | 26,452 | 10,206 | 7,877 | 2,331 |
| 1974 | 42,415 | 15,234 | 27,181 | 9,774 | 7,407 | 2,367 |
| 1975 | 40,781 | 14,509 | 26,272 | 9,634 | 7,467 | 2,167 |
| 1976 | 42,805 | 15,159 | 27,646 | 10,046 | 7,799 | 2,247 |
| 1977 | 44,330 | 15,584 | 28,746 | 10,450 | 8,152 | 2,299 |
| 1978 | 46,115 | 15,493 | 30,622 | 10,438 | 7,913 | 2,525 |
| 1979 | 48,652 | 15,932 | 32,720 | 10,230 | 7,430 | 2,800 |
| 1980 | 51,919 | 16,366 | 35,553 | 10,733 | 7,734 | 2,999 |
| 1981 | 55,140 | 17,435 | 37,705 | 12,732 | 9,072 | 3,660 |
| 1982 | 57,995 | 18,483 | 39,512 | 13,658 | 9,776 | 3,882 |
| 1983 | 61,047 | 19,779 | 41,268 | 13,346 | 10,024 | 3,322 |
| 1984 | 66,342 | 21,500 | 44,842 | 14,883 | 11,351 | 3,531 |
| 1985[r] | 70,861 | 24,134 | 46,728 | 16,118 | 12,347 | 3,771 |
| 1986 | 70,696 | 24,359 | 46,337 | 14,239 | 10,609 | 3,631 |

Source: National Science Foundation.
NOTE: Detail may not add to totals because of rounding.

a Includes all manufacturing industries, plus those non-manufacturing industries known to conduct or finance research and development.

b Companies classified in SIC codes 372 and 376, having as their principal activity the manufacture of aircraft, guided missiles, space vehicles, and parts.

c Company funds include all funds for industrial R&D work performed within company facilities except funds provided by the Federal Government. Excluded are company-financed research and development contracted to outside organizations such as research institutions, universities and colleges, or other non-profit organizations.

d Based on GNP implicit price deflator.

r Revised.

## TOTAL U.S. FUNDS FOR RESEARCH AND DEVELOPMENT BY SOURCE AND PERFORMER[a]

Calendar Years 1985-1988
(Millions of Current Dollars)

| Source of Funds | Total All Performers | Performer | | | | |
|---|---|---|---|---|---|---|
| | | Federal Government | Industry | Colleges & Universities | Federally-Funded Research & Development Centers | Nonprofit Institutions |
| **1985** | | | | | | |
| **All Sources—TOTAL** | $107,436 | $12,495 | $78,208 | $9,504 | $3,529 | $3,250 |
| Federal Government | 51,276 | 12,495 | 26,484 | 6,003 | 3,529 | 2,315 |
| Industry | 52,597 | — | 51,724 | 538 | — | 335 |
| Colleges & Universities | 2,259 | — | — | 2,259 | — | — |
| Nonprofit Institutions | 1,304 | — | — | 704 | — | 600 |
| **1986**[p] | | | | | | |
| **All Sources—TOTAL** | $114,697 | $13,535 | $83,562 | $10,600 | $3,600 | $3,400 |
| Federal Government | 55,273 | 13,535 | 28,988 | 6,750 | 3,600 | 2,400 |
| Industry | 55,549 | — | 54,574 | 600 | — | 375 |
| Colleges & Universities | 2,500 | — | — | 2,500 | — | — |
| Nonprofit Institutions | 1,375 | — | — | 750 | — | 625 |
| **1987**[E] | | | | | | |
| **All Sources—TOTAL** | $123,050 | $15,450 | $89,200 | $11,150 | $3,800 | $3,450 |
| Federal Government | 60,350 | 15,450 | 31,700 | 7,000 | 3,800 | 2,400 |
| Industry | 58,570 | — | 57,500 | 670 | — | 400 |
| Colleges & Universities | 2,700 | — | — | 2,700 | — | — |
| Nonprofit Institutions | 1,430 | — | — | 780 | — | 650 |
| **1988**[E] | | | | | | |
| **All Sources—TOTAL** | $131,600 | $16,400 | $95,950 | $11,725 | $4,000 | $3,525 |
| Federal Government | 64,550 | 16,400 | 34,500 | 7,250 | 4,000 | 2,400 |
| Industry | 62,625 | — | 61,450 | 750 | — | 425 |
| Colleges & Universities | 2,900 | — | — | 2,900 | — | — |
| Nonprofit Institutions | 1,525 | — | — | 825 | — | 700 |

Source: National Science Foundation
a Source-performer detail not available by industry
p Preliminary
E Estimate

INTENTIONAL BLANK

## ESTIMATED SOURCES OF FUNDS FOR R&D BY BROAD INDUSTRIAL CLASSES, 1988[a]

(Millions of Current Dollars)

| | Federal Funds | Industry Funds | Total Funds | % Federal |
|---|---|---|---|---|
| Aerospace | $ 19,103 | $ 4,928 | $ 24,031 | 79.49% |
| Electrical Machine Communications | 8,189 | 12,255 | 20,444 | 40.06 |
| Machinery | 1,486 | 10,403 | 11,889 | 12.50 |
| Chemicals | 287 | 9,356 | 9,643 | 2.98 |
| Autos, Trucks & Parts, & Other Transportation Equipment | 2,121 | 7,117 | 9,238 | 22.96 |
| Professional & Scientific Instruments | 1,034 | 5,765 | 6,799 | 15.21 |
| Petroleum Products | 22 | 2,431 | 2,454 | 0.91 |
| Rubber Products | 246 | 1,272 | 1,518 | 16.18 |
| Food & Beverage | 0 | 1,067 | 1,067 | 0.00 |
| Paper Pulp | 4 | 863 | 867 | 0.44 |
| Fabricated Metals | 49 | 740 | 790 | 6.26 |
| Stone, Clay & Glass | 122 | 650 | 772 | 15.80 |
| Nonferrous Metals | 218 | 532 | 750 | 29.11 |
| Iron & Steel | 219 | 505 | 724 | 30.28 |
| Textiles | 0 | 166 | 166 | 0.00 |
| Other Manufacturing | 36 | 1,371 | 1,408 | 2.59 |
| Total Manufacturing | $ 33,137 | $ 59,422 | $ 92,559 | 35.80 |
| Nonmanufacturing | 1,536 | 1,707 | 3,243 | 47.36 |
| TOTAL | 34,673 | 61,129 | 95,802 | 36.19 |

Source: Battelle Memorial Institute

a. Battelle data revised from the National Science Foundation and McGraw-Hill surveys

## RESEARCH AND DEVELOPMENT FUNDS AS PERCENT OF NET SALES ALL MANUFACTURING INDUSTRIES AND THE AEROSPACE INDUSTRY

Calendar Years 1981-1986

| Year | All Manufacturing Industries[a] | | Aerospace Industry[b] | |
|---|---|---|---|---|
| | Total R&D Funds as Percent of Net Sales | Company R&D Funds as Percent of Net Sales | Total R&D Funds as Percent of Net Sales | Company R&D Funds as Percent of Net Sales |
| 1981 | 3.1% | 2.2% | 16.0% | 4.6% |
| 1982 | 3.8 | 2.6 | 17.7 | 5.0 |
| 1983 | 3.9 | 2.6 | 16.2 | 4.0 |
| 1984 | 3.8 | 2.6 | 16.9 | 4.0 |
| 1985[r] | 4.4 | 2.9 | 16.9 | 3.9 |
| 1986 | 4.7 | 3.1 | 15.7 | 4.0 |

Source: National Science Foundation

a Includes all manufacturing industries known to con[illegible]t or finance research and development.

b Companies classified in SIC codes 372 and 376 h[illegible]ng as their principal activity the manufacture of aircraft, guided missiles, space vehicles, and parts.

r Revised.

## R&D EXPENDITURES BY STATE BY INDUSTRY, 1985

(Dollars in millions)

| | Total, all states | California | New York | Michigan | New Jersey | Massachusetts | Pennsylvania | Texas | Illinois | Ohio | All other states |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total, all industries | $78,208 | $17,760 | $7,019 | $5,975 | $5,547 | $4,173 | $3,570 | $3,492 | $3,231 | $2,847 | $24,594 |
| Aircraft & missiles | 17,619 | 9,953 | 413 | 114 | 58 | 274 | 300 | 531 | 328 | 60 | 5,583 |
| Electrical equipment | 17,080 | 1,920 | 1,503 | 60 | 2,878 | 1,940 | 1,325 | 869 | 1,072 | 692 | 4,821 |
| Machinery | 10,870 | 1,237 | NA | 127 | 244 | 954 | 255 | 413 | 632 | 190 | NA |
| Chemicals & allied products | 8,667 | 383 | 1,154 | 607 | 1,322 | 125 | 716 | 250 | 514 | 571 | 3,025 |
| Motor vehicles | 7,058 | NA | 232 | 4,796 | NA | NA | NA | NA | NA | NA | 671 |
| Instruments | 5,430 | 1,061 | NA | NA | 333 | 559 | 252 | 169 | 92 | 52 | NA |
| Petroleum refining | NA | 442 | 81 | NA | NA | NA | 119 | 535 | NA | NA | 276 |
| Food & tobacco products | NA | 65 | 114 | 36 | 109 | NA | NA | 12 | 140 | 19 | 503 |
| Rubber products | 1,147 | 257 | NA | NA | NA | NA | NA | 10 | NA | 533 | 259 |
| Primary metals | NA | 59 | 41 | 70 | NA | NA | 190 | NA | NA | 74 | 169 |
| Nonmanufacturing | 2,851 | 1,079 | 147 | 58 | 29 | 103 | 40 | 82 | 32 | 75 | 1,206 |
| All other industries | 3,018 | NA | 166 | 68 | 63 | 110 | 252 | 43 | 175 | 258 | 1,525 |

Source: National Science Foundation, Division of Science Resources Studies.

NOTE: NA indicates that data are unavailable because of Census Bureau restrictions on the publication of data that would reveal the operations of individual companies.

Total R&D funds data are unavailable for the petroleum refining, food & tobacco products, and primary metals industries because of restrictions on publishing data showing Federal R&D support to these industries. The amount of companies' own funds spent by each of these industries in 1985 was: petroleum refining, $2.106 billion; food & tobacco products, $1.042 billion; and primary metals, $758 million.

# FUNDS FOR INDUSTRIAL RESEARCH AND DEVELOPMENT IN THE AEROSPACE INDUSTRY

By Type of Research and Funding Source
Calendar Years 1963-1985[a]
(Millions of Dollars)

| Year | TOTAL AERO-SPACE | Basic Research | | | Applied Research | | | Development | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Total | Federal Funds | Com-pany Funds | Total | Federal Funds | Com-pany Funds | Total | Federal Funds | Com-pany Funds |
| 1963 | $ 4,712 | $ 59 | $31 | $28 | $ 735 | $ 585 | $ 150 | $ 3,917 | $3,634 | $ 283 |
| 1964 | 5,078 | 67 | 34 | 34 | 766 | 607 | 159 | 4,244 | 3,948 | 296 |
| 1965 | 5,148 | 71 | 41 | 30 | 735 | 563 | 172 | 4,342 | 3,921 | 421 |
| 1966 | 5,526 | 69 | 36 | 33 | 773 | 563 | 210 | 4,685 | 4,162 | 523 |
| 1967 | 5,669 | 71 | 33 | 38 | 726 | 490 | 236 | 4,871 | 4,071 | 800 |
| 1968 | 5,765 | 68 | 26 | 42 | 677 | 426 | 251 | 5,021 | 4,145 | 876 |
| 1969 | 5,882 | 65 | 24 | 41 | 597 | 347 | 250 | 5,220 | 4,216 | 1,004 |
| 1970 | 5,219 | 63 | 20 | 43 | 565 | 352 | 213 | 4,591 | 3,718 | 873 |
| 1971 | 4,881 | 54 | 37 | 17 | 461 | 279 | 182 | 4,365 | 3,583 | 782 |
| 1972 | 4,950 | 60 | 44 | 16 | 451 | 267 | 184 | 4,438 | 3,722 | 716 |
| 1973 | 5,052 | 50 | 21 | 29 | 512 | 308 | 204 | 4,491 | 3,633 | 858 |
| 1974 | 5,278 | 51 | 19 | 32 | 609 | 360 | 249 | 4,617 | 3,735 | 882 |
| 1975 | 5,713 | 54 | 17 | 37 | 614 | 381 | 233 | 5,044 | 4,119 | 925 |
| 1976 | 6,339 | 54 | 21 | 33 | 666 | 365 | 301 | 5,619 | 4,521 | 1,098 |
| 1977[a] | 7,033 | 56 | 25 | 31 | 753 | 419 | 334 | 6,223 | 5,017 | 1,206 |
| 1979 | 8,041 | 86 | 44 | 42 | 880 | 499 | 381 | 7,076 | 5,314 | 1,762 |
| 1981 | 11,968 | 131 | 60 | 71 | 1,484 | 897 | 587 | 10,353 | 7,738 | 2,615 |
| 1983 | 13,853 | 146 | NA | NA | 3,466 | NA | NA | 10,241 | 7,668 | 2,573 |
| 1984 | 16,033 | 247 | NA | NA | 3,067 | NA | NA | 12,718 | 9,870 | 2,848 |
| 1985 | 17,619 | 304 | 162 | 142 | 3,785 | 2,776 | 1,009 | 13,530 | 10,483 | 3,047 |

Source: National Science Foundation, plus estimates by AIA to adjust originally published breakouts by Research Type and Funding Source to NSF's revised totals.

NOTE: Detail may not add to totals because of rounding.

a Break-outs by Research Type and Funding Source available only for odd numbered years after 1977.

NA Not available.

r Revised.

# FEDERAL AERONAUTICS RESEARCH AND DEVELOPMENT

**Fiscal Years 1970-1988**
**(Millions of Dollars)**

| Year | TOTAL | NASA[a] | DOD[b] | DOT[c] |
|---|---|---|---|---|
| **BUDGET AUTHORITY** | | | | |
| 1970 | $1,882 | $199 | $1,641 | $ 42 |
| 1971 | 1,990 | 210 | 1,707 | 73 |
| 1972 | 2,295 | 236 | 1,964 | 95 |
| 1973 | 2,187 | 313 | 1,799 | 75 |
| 1974 | 2,030 | 278 | 1,678 | 74 |
| 1975 | 2,015 | 314 | 1,627 | 74 |
| 1976 | 2,351 | 325 | 1,941 | 85 |
| Tr. Qtr. | 584 | 83 | 480 | 22 |
| 1977 | 2,727 | 378 | 2,256 | 93 |
| 1978 | 3,338 | 437 | 2,807 | 94 |
| 1979 | 2,850 | 519 | 2,240 | 91 |
| 1980 | 2,991 | 560 | 2,336 | 95 |
| 1981 | 3,286 | 526 | 2,653 | 106 |
| 1982 | 3,581 | 516 | 2,984 | 81 |
| 1983 | 3,871 | 547 | 3,221 | 103 |
| 1984 | 4,087 | 600 | 3,224 | 263 |
| 1985 | 4,355 | 648 | 3,422 | 265 |
| 1986 | 6,660 | 601 | 4,927 | 1,132 |
| 1987[E] | 6,817 | 698 | 5,173 | 946 |
| 1988[E] | 9,234 | 725 | 7,009 | 1,500 |
| **OUTLAYS** | | | | |
| 1982[d] | $3,309 | $563 | $2,657 | $ 89 |
| 1983 | 3,554 | 563 | 2,920 | 71 |
| 1984 | 3,727 | 586 | 2,995 | 146 |
| 1985 | 4,010 | 643 | 3,101 | 266 |
| 1986 | 6,071 | 648 | 4,373 | 1,050 |
| 1987[E] | 6,526 | 622 | 4,867 | 1,037 |
| 1988[E] | 7,707 | 683 | 5,923 | 1,101 |

Source: NASA, "Aeronautics and Space Report of the President" (Annually).
*a* Research and Development, Construction of Facilities, Research and Program Management.
*b* Research, Development, Testing and Evaluation of aircraft and related equipment.
*c* Federal Aviation Administration Research, Engineering and Development, and Facilities, Engineering and Development.
*d* First year outlays data available.
*E* Estimate. Latest year reflects Administration's budget proposal.

# FEDERAL OUTLAYS FOR CONDUCT OF RESEARCH AND DEVELOPMENT

Fiscal Years 1975-1989
(Millions of Dollars)

| Year | TOTAL | DOD | NASA | Energy[a] | Other |
|---|---|---|---|---|---|
| **CURRENT DOLLARS** | | | | | |
| 1975 | $19,525 | $ 9,341 | $3,266 | $2,277 | $ 4,641 |
| 1976 | 20,233 | 9,329 | 3,521 | 2,225 | 5,158 |
| 1977 | 22,462 | 10,176 | 3,763 | 3,181 | 5,342 |
| 1978 | 24,532 | 10,726 | 3,833 | 3,925 | 6,048 |
| 1979 | 26,578 | 11,454 | 4,064 | 4,413 | 6,648 |
| 1980 | 30,351 | 13,451 | 4,711 | 4,698 | 7,492 |
| 1981 | 34,252 | 15,720 | 5,279 | 5,121 | 8,132 |
| 1982 | 34,509 | 18,201 | 3,220 | 4,974 | 8,114 |
| 1983 | 36,560 | 21,057 | 2,538 | 4,771 | 8,193 |
| 1984 | 40,518 | 23,583 | 3,539 | 4,702 | 8,694 |
| 1985 | 45,244 | 27,878 | 2,970 | 4,900 | 9,496 |
| 1986 | 51,576 | 33,292 | 3,432 | 4,705 | 10,147 |
| 1987 | 52,862 | 34,581 | 3,250 | 4,682 | 10,349 |
| 1988[E] | 54,162 | 33,776 | 3,962 | 4,941 | 11,483 |
| 1989[E] | 59,314 | 37,023 | 4,820 | 5,082 | 12,389 |
| **CONSTANT DOLLARS (1982 = 100)[b]** | | | | | |
| 1975 | $33,945 | $16,240 | $5,678 | $3,959 | $ 8,068 |
| 1976 | 32,592 | 15,027 | 5,672 | 3,584 | 8,309 |
| 1977 | 33,510 | 15,181 | 5,614 | 4,746 | 7,970 |
| 1978 | 34,205 | 14,955 | 5,344 | 5,473 | 8,433 |
| 1979 | 34,118 | 14,703 | 5,217 | 5,665 | 8,534 |
| 1980 | 35,817 | 15,873 | 5,559 | 5,544 | 8,841 |
| 1981 | 36,743 | 16,863 | 5,663 | 5,493 | 8,723 |
| 1982 | 34,509 | 18,201 | 3,220 | 4,974 | 8,114 |
| 1983[r] | 35,076 | 20,202 | 2,435 | 4,577 | 7,861 |
| 1984[r] | 37,451 | 21,798 | 3,271 | 4,346 | 8,036 |
| 1985[r] | 40,509 | 24,960 | 2,659 | 4,387 | 8,502 |
| 1986[r] | 44,903 | 28,985 | 2,988 | 4,096 | 8,834 |
| 1987 | 44,806 | 29,311 | 2,755 | 3,968 | 8,772 |
| 1988[E] | 44,268 | 27,606 | 3,238 | 4,038 | 9,385 |
| 1989[E] | 46,704 | 29,152 | 3,795 | 4,002 | 9,755 |

Source: The Budget of the United States Government, Special Analyses. (Annually)
NOTE: Detail may not add to totals because of rounding.
*a* Energy research and development programs transferred from AEC to ERDA with 1974 reorganization and to Dept. of Energy in 1977.
*b* Based on Fiscal Year GNP implicit price deflator.
*E* Estimate. Latest year reflects Administration's budget proposal.
*r* Revised.

## DEPARTMENT OF DEFENSE APPROPRIATIONS FOR RESEARCH, DEVELOPMENT, TEST AND EVALUATION

Fiscal Years 1987-1989
(Millions of Dollars)

| | 1987 | 1988[E] | 1989[E] |
|---|---|---|---|
| **TOTAL—APPROPRIATIONS FOR RDT&E** | $35,941 | $37,263 | $38,157 |
| **BY APPROPRIATION** | | | |
| Army | $ 4,699 | $ 4,671 | $ 5,031 |
| Navy | 9,292 | 9,513 | 9,216 |
| Air Force | 15,051 | 15,165 | 14,932 |
| Defense Agencies | 6,768 | 7,662 | 8,668 |
| Director of Test & Evaluation, Defense | 120 | 182 | 167 |
| Director of Operational Test & Evaluation, Defense | 11 | 70 | 143 |
| **BY RESEARCH CATEGORIES** | | | |
| Research | $ 894 | $ 901 | $ 916 |
| Exploratory Development | 2,343 | 2,392 | 2,361 |
| Advanced Development | 10,426 | 12,446 | 11,174 |
| Engineering Development | 9,341 | 9,641 | 11,587 |
| Management and Support | 2,943 | 2,514 | 2,560 |
| Operational Systems Development | 9,995 | 9,370 | 9,558 |
| **RECAP OF BUDGET ACTIVITIES** | | | |
| Technology Base | $ 3,237 | $ 3,294 | $ 3,277 |
| Advanced Technology Development | 5,032 | 5,434 | 6,507 |
| Strategic Programs | 7,703 | 7,391 | 6,525 |
| Tactical Programs | 11,032 | 12,212 | 13,093 |
| Intelligence and Communications | 4,702 | 4,882 | 4,470 |
| Defensewide Mission Support | 4,236 | 4,051 | 4,285 |
| **RECAP OF FYDP PROGRAMS** | | | |
| Strategic Forces | $ 1,147 | $ 832 | $ 697 |
| General Purpose Forces | 2,192 | 1,763 | 2,012 |
| Intelligence and Communications | 6,362 | 6,245 | 6,205 |
| Airlift Sealift | 97 | 27 | 13 |
| Guard and Reserve | 37 | 60 | 83 |
| Research and Development (FYDP Program 6) | 25,946 | 27,894 | 28,599 |
| Central Supply and Maintenance | 151 | 177 | 217 |
| Training, Medical and Other | 4 | — | — |
| Support of Other Nations | 4 | 4 | 4 |
| Special Operations Forces | (a) | 262 | 327 |

Source: Department of Defense Budget: R.D.T&E Programs (R-1) (Annually).
NOTE Detail may not add to totals because of rounding.
a Less than $1 million.
E Estimate. Latest year reflects Administration's budget proposal.

## DEPARTMENT OF DEFENSE
## OUTLAYS FOR RESEARCH, DEVELOPMENT, TEST AND EVALUATION

Fiscal Years 1971-1989
(Millions of Dollars)

| Year | TOTAL, All RDT&E Functions | Air Force | Navy | Army | Other |
|---|---|---|---|---|---|
| 1971 | $ 7,303 | $ 2,809 | $2,405 | $1,569 | $ 520 |
| 1972 | 7,881 | 3,205 | 2,427 | 1,779 | 470 |
| 1973 | 8,157 | 3,362 | 2,404 | 1,912 | 479 |
| 1974 | 8,582 | 3,240 | 2,623 | 2,190 | 529 |
| 1975 | 8,866 | 3,308 | 3,021 | 1,964 | 573 |
| 1976 | 8,923 | 3,338 | 3,215 | 1,842 | 528 |
| Tr. Qtr. | 2,203 | 830 | 778 | 437 | 161 |
| 1977 | 9,795 | 3,618 | 3,481 | 2,069 | 627 |
| 1978 | 10,508 | 3,626 | 3,825 | 2,342 | 715 |
| 1979 | 11,152 | 4,080 | 3,826 | 2,409 | 837 |
| 1980 | 13,727 | 5,017 | 4,382 | 2,707 | 1,021 |
| 1981 | 15,278 | 6,341 | 4,783 | 2,958 | 1,196 |
| 1982 | 17,729 | 7,794 | 5,240 | 3,230 | 1,465 |
| 1983 | 20,554 | 9,182 | 5,854 | 3,658 | 1,861 |
| 1984 | 23,117 | 10,353 | 6,662 | 3,812 | 2,289 |
| 1985 | 27,103 | 11,573 | 8,054 | 3,950 | 3,526 |
| 1986 | 32,283 | 13,417 | 9,667 | 3,984 | 5,215 |
| 1987 | 33,596 | 13,347 | 9,176 | 4,721 | 6,352 |
| 1988[E] | 33,126 | 12,905 | 8,339 | 4,539 | 7,343 |
| 1989[E] | 36,295 | 14,242 | 8,803 | 4,802 | 8,448 |

Source: Department of Defense Budget (Annually)
E Estimate. Latest year reflects Administration's budget proposal

## DEPARTMENT OF DEFENSE
## PRIME CONTRACT AWARDS
## FOR RESEARCH, DEVELOPMENT, TEST AND EVALUATION

Fiscal Years 1983-1987
(Millions of Dollars)

| Program Categories | 1983 | 1984 | 1985 | 1986 | 1987 |
|---|---|---|---|---|---|
| **TOTAL—RDT&E** | $16,301 | $18,277 | $18,938 | $19,812 | $21,809 |
| Research | 763 | 957 | 1,142 | 1,664 | 1,730 |
| Exploratory Development | 1,261 | 1,246 | 1,716 | 1,494 | 1,524 |
| Other Development | 13,915 | 15,616 | 15,432 | 15,870 | 17,964 |
| Management & Support | 362 | 459 | 648 | 784 | 592 |
| **Aircraft—TOTAL** | $ 2,072 | $ 2,316 | $ 2,304 | $ 3,160 | $ 3,561 |
| Research | 36 | 95 | 130 | 591 | 437 |
| Exploratory Development | 152 | 142 | 139 | 106 | 103 |
| Other Development | 1,879 | 2,074 | 2,025 | 2,449 | 3,007 |
| Management & Support | 6 | 4 | 9 | 14 | 14 |
| **Missile and Space Systems—TOTAL** | 6,444 | 7,296 | 7,119 | 6,873 | 7,943 |
| Research | 34 | 14 | 23 | 22 | 64 |
| Exploratory Development | 239 | 224 | 385 | 325 | 356 |
| Other Development | 6,097 | 6,937 | 6,583 | 6,401 | 7,401 |
| Management & Support | 73 | 120 | 127 | 125 | 122 |
| **Electronics & Communications Equipment—TOTAL** | 4,681 | 4,644 | 4,718 | 4,515 | 4,637 |
| Research | 76 | 95 | 126 | 122 | 162 |
| Exploratory Development | 404 | 397 | 394 | 325 | 280 |
| Other Development | 4,127 | 4,042 | 4,083 | 3,983 | 4,117 |
| Management & Support | 75 | 111 | 115 | 86 | 79 |
| **All Other—TOTAL**[a] | 3,104 | 4,021 | 4,797 | 5,264 | 5,668 |
| Research | 617 | 753 | 863 | 930 | 1,067 |
| Exploratory Development | 466 | 483 | 798 | 738 | 785 |
| Other Development | 1,812 | 2,561 | 2,741 | 3,037 | 3,439 |
| Management & Support | 208 | 224 | 397 | 559 | 377 |

Source: Department of Defense, "Prime Contract Awards by Service Category and Federal Supply Classification" (Annually).
NOTE: Detail may not add to totals because of rounding.
a "All Other" includes ships; tank-automotive; weapons; ammunition; services; and other.

## DEPARTMENT OF DEFENSE
## NET VALUE OF PRIME CONTRACT AWARDS OVER $25,000[a]
## FOR RESEARCH, DEVELOPMENT, TEST & EVALUATION

By Region and Type of Contractor
Fiscal Year 1987

| REGION | TOTAL | Type of Contractor | | |
|---|---|---|---|---|
| | | Educational Institutions | Other Non-Profit Institutions[a] | Business Firms |
| **TOTAL—Millions of Dollars** | $21,392 | $1,475 | $1,218 | $18,698 |
| New England | $ 2,687 | $ 475 | $ 498 | $ 1,715 |
| Middle Atlantic | 2,515 | 148 | 27 | 2,340 |
| East North Central | 813 | 73 | 81 | 659 |
| West North Central | 935 | 13 | 3 | 919 |
| South Atlantic | 2,726 | 451 | 140 | 2,136 |
| East South Central | 490 | 21 | 6 | 463 |
| West South Central | 1,098 | 58 | 11 | 1,029 |
| Mountain | 2,396 | 66 | 2 | 2,328 |
| Pacific[b] | 7,732 | 171 | 452 | 7,109 |
| **PERCENT OF TOTAL** | 100.0% | 100.0% | 100.0% | 100.0% |
| New England | 12.6% | 32.2% | 40.8% | 9.2% |
| Middle Atlantic | 11.8 | 10.0 | 2.2 | 12.5 |
| East North Central | 3.8 | 5.0 | 6.6 | 3.5 |
| West North Central | 4.4 | 0.9 | 0.2 | 4.9 |
| South Atlantic | 12.7 | 30.5 | 11.5 | 11.4 |
| East South Central | 2.3 | 1.4 | 0.5 | 2.5 |
| West South Central | 5.1 | 3.9 | 0.9 | 5.5 |
| Mountain | 11.2 | 4.5 | 0.1 | 12.5 |
| Pacific[b] | 36.1 | 11.6 | 37.1 | 38.0 |

Source: Department of Defense, "Prime Contract Awards by Region and State" (Annually).
NOTE: Detail may not add to totals because of rounding.
a Includes contracts with other government agencies.
b Includes Alaska and Hawaii.

## MISSILE PROGRAMS
## RESEARCH, DEVELOPMENT, TEST AND EVALUATION[a]

**By Agency, Type and Model**
**Fiscal Years 1987, 1988 and 1989**
**(Millions of Dollars)**

| Agency, Type and Model | 1987 | 1988[E] | 1989[E] |
|---|---|---|---|
| **AIR FORCE** | | | |
| ALCM | $ 0.7 | $ 3.6 | $ 1.0 |
| AMRAAM[b] | 41.6 | 48.4 | 13.6 |
| *ASMS | 150.0 | 133.6 | 152.0 |
| Peacekeeper (M-X) | 290.0 | 36.0 | 40.0 |
| *Small ICBM in Hard Mobile Basing | 763.5 | 682.3 | 200.0 |
| *SRAM II | 65.5 | 174.3 | 231.5 |
| **NAVY** | | | |
| *AAAM | $ — | $ 16.6 | $ 30.4 |
| *AEGIS ER | 29.2 | 63.6 | 100.7 |
| Harm[b] | 3.6 | 6.0 | — |
| Harpoon | 19.0 | 31.9 | 22.6 |
| Hawk[e] | 1.7 | 1.3 | 5.7 |
| Penguin | 16.7 | 14.5 | 4.1 |
| RAM | 22.8 | 12.6 | 8.6 |
| Sidewinder[b] | 23.3 | 19.5 | 21.3 |
| Standard | 73.5 | 93.0 | 152.8 |
| Tomahawk | 77.3 | 70.5 | 60.3 |
| Trident II | 1,567.3 | 1,042.8 | 573.3 |
| VLA | 39.2 | 40.4 | 30.3 |
| **ARMY** | | | |
| *Advanced Anti-Tank Weapon System | $ 42.6 | $ 33.6 | $ 134.6 |
| ATACMS | 76.3 | 101.3 | 84.6 |
| Chaparral | 9.4 | 1.5 | — |
| Laser Hellfire[c] | 9.2 | 21.1 | 10.6 |
| LOS-F-H | 23.6 | 99.0 | 49.8 |
| Patriot | 21.7 | 18.3 | 23.1 |
| STINGER | 1.0 | 3.0 | — |
| TOW 2[d] | 4.8 | 18.9 | 20.3 |

Source: "Program Acquisition Costs by Weapon System," Department of Defense Budget (Annually).
NOTE: See Missile Programs Chapter for missile program procurement authorization data.
*E* Estimate. Latest year reflects Administration's budget proposal.
*a* Total Obligational Authority.
*b* Navy and Air Force funding.
*c* Army and Navy funding.
*d* Army and Marine Corps funding.
*e* Marine Corps funding.
*g* Navy and Marine Corps funding.
* Programs in R&D only.

# MILITARY AIRCRAFT PROGRAMS
# RESEARCH, DEVELOPMENT, TEST AND EVALUATION[a]

**By Agency, Type and Model**
**Fiscal Years 1987, 1988 and 1989**
**(Millions of Dollars)**

| Agency, Type and Model | 1987 | 1988[E] | 1989[E] |
|---|---|---|---|
| **AIR FORCE** | | | |
| AC-130U | $ 21.7 | $ 67.3 | $ 64.7 |
| *Advanced Tactical Fighter | 261.3 | 498.1 | 702.3 |
| *Aircraft Engine Component Improvement Program[b] | 110.3 | 90.7 | 94.5 |
| C-17 | 615.7 | 1,115.6 | 961.1 |
| F-15 C/D/E | 153.3 | 105.6 | 89.1 |
| F-16 Multimission Fighter (Falcon) | 53.7 | 25.4 | 26.5 |
| KC-135 Re-engining modern | 0.4 | 4.0 | 3.2 |
| LANTIRN (Night Precision Attack) | 37.9 | 19.8 | 4.7 |
| MC-130H Combat Talon[c] | 11.9 | 9.4 | 21.6 |
| TR-1/U-2 | 20.5 | 69.7 | 102.2 |
| **NAVY** | | | |
| A-6 Intruder | $189.7 | $ 215.5 | $ 1.4 |
| AH-1W Sea Cobra | 1.0 | 13.1 | 12.0 |
| AV-8B | 41.8 | 36.7 | 39.2 |
| CH/MH-53E Super Stallion | 3.6 | 9.6 | 9.0 |
| E-2C Hawkeye | 32.8 | 21.1 | 23.1 |
| E-6A | 76.1 | 35.7 | — |
| EA-6B Prowler | 50.1 | 65.6 | 26.6 |
| F-14 A/D Tomcat | 278.7 | 164.0 | 167.7 |
| F/A-18 Hornet | 30.0 | 11.9 | 13.2 |
| Joint Services Adv. Vert. Lift Aircraft (V-22)[b] | 421.4 | 465.7 | 306.7 |
| *LRAACA | — | 1.8 | 69.1 |
| *National Aerospace Plane | 110.0 | 183.0 | 245.0 |
| P-3C/G Orion | 53.1 | 96.0 | 150.7 |
| SH-60B Seahawk (LAMPS MK-III) | 18.6 | 18.4 | 5.1 |
| SH-60F CV ASW | 36.0 | — | — |
| T-45 Training System | 134.2 | 94.6 | 87.8 |
| **ARMY** | | | |
| AH-64 Attack Helicopter | $ — | $ 18.4 | $ 4.8 |
| *LHX Army Helicopter | 100.9 | 130.0 | 180.9 |
| RPVs | 65.2 | — | — |
| UH-60A Black Hawk | — | 15.0 | 41.0 |

Source: "Program Acquisition Costs by Weapon System," Department of Defense Budget (Annually).
NOTE: See Aircraft Production Chapter for aircraft program procurement authorization data.
a Total Obligational Authority.
b Air Force and Navy funding.
c Air Force, Navy and Marine Corps funding.
d Army, Navy and Air Force funding.
E Estimate. Latest year reflects Administration's budget proposal.
* Programs in R&D only.

# Foreign Trade

In a year when the United States as a whole experienced its 12th consecutive international merchandise trade deficit, the U.S. aerospace industry posted new records for export volume and trade balance.

In 1987, aerospace exports amounted to $23.9 billion and represented almost 10 percent of the total U.S. export volume in dollar value terms.

U.S. imports of aerospace products also reached a new record level. In rounded-off figures, 1987 imports of $7.9 billion were the same as the recorded level of 1986 but the exact 1987 figure was $3 million higher.

The resulting $16 billion aerospace trade balance for 1987 topped the prior record (1981) by almost $3 billion and the 1986 figure by $3.2 billion.

The $23.9 billion in aerospace exports represented a gain of more than 15 percent above the previous record $20.7 billion of 1986. The composition of the aerospace export volume was roughly two-thirds civil products. In 1986, the civil/military export ratio was 71 percent civil, 29 percent military.

Civil exports increased from $14.8 billion in 1986 to $16.2 billion in 1987, sparked by the third straight annual increase in sales of civil aircraft, predominantly transport aircraft. Transport sales to foreign customers accounted for $6.4 billion, up from $6.3 billion.

A breakdown of the civil exports categories shows sales of complete aircraft totaling $7.6 billion (up from $7.4 billion in 1986); aircraft and engine parts $7.2 billion (up from $6.5 billion); and aircraft engines $1.3 billion (up from $1.0 billion).

Exports of general aviation aircraft, which had declined sharply in earlier years, continued the rallying upturn initiated in 1986. Sales for 1987 totaled $327 million, which compared with $243 million in 1986 and $191 million in 1985. Helicopter exports, however, dipped to $239 million from the previous year's $277 million.

At $7.7 billion, military aerospace exports reached an all-time high; the 1987 figure compared with $5.9 billion in 1986. The increase spread across the board: export sales of complete aircraft amounted to $3.6 billion (up from

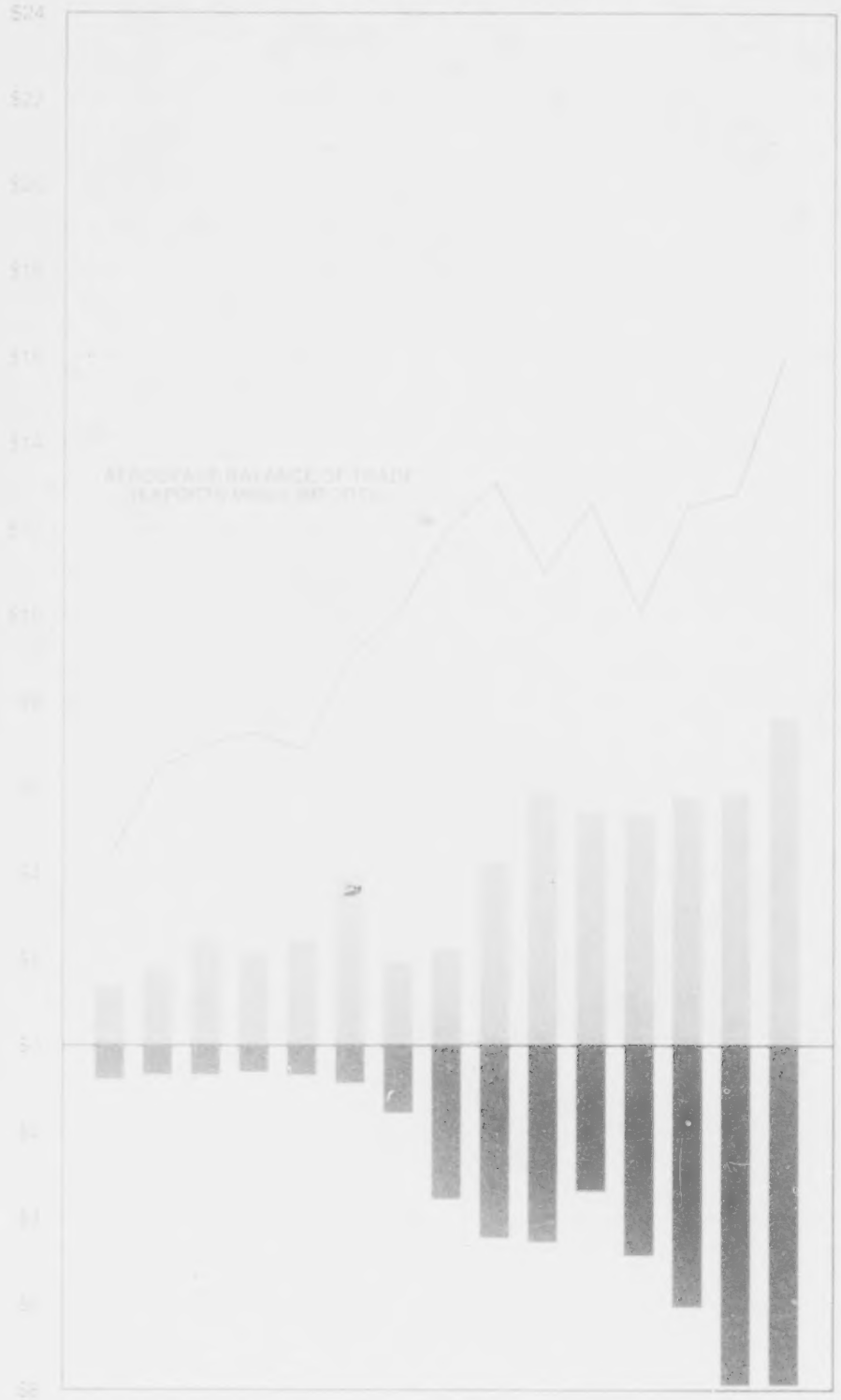
$2.5 billion); sales of aircraft and engine parts totaled $3.1 billion (up from $2.6 billion); sales of missiles, rockets and parts accounted for $848 million (up from $657 million); and sales of complete aircraft engines came to $161 million (up from $111 million).

Civil products, at $6.4 billion, accounted for more than 80 percent of the aerospace import volume. The breakdown shows only minor changes from the previous year: aircraft and engine parts $3.3 billion (up $39 million); complete aircraft $2.0 billion (down $12 million); and complete aircraft engines $1.1 billion (down $16 million). Military imports of $1.5 billion consisted almost entirely of aircraft and engine parts ($1.3 billion, up from $1.2 billion).

The principal customer nations for U.S. aerospace exports in 1987 were Japan, which bought products with a total value of $2.3 billion; the United Kingdom, $2.3 billion; France, $1.4 billion; West Germany, $1.3 billion; and Australia, $1.0 billion.

The United Kingdom led the list of countries of origin for U.S. aerospace imports with a total value of $2.0 billion. Next were France, just under $2 billion; Canada, $1.8 billion; West Germany, $347 million; and Japan, $319 million. □

## AEROSPACE EXPORTS, IMPORTS AND TRADE BALANCE




Source: Aerospace Industries Association

# U.S. TOTAL AND AEROSPACE FOREIGN TRADE[a]

Calendar Years 1963-1987
(Millions of Dollars)

| Year | Total U.S. Merchandise Trade | | | Aerospace | | |
|---|---|---|---|---|---|---|
| | Trade Balance | Exports | Imports | Trade Balance | Exports | Imports |
| 1963 | $ 6,061 | $ 23,062 | $ 17,001 | $ 1,532 | $ 1,627 | $ 95 |
| 1964 | 7,555 | 26,156 | 18,601 | 1,518 | 1,608 | 90 |
| 1965 | 5,875 | 27,127 | 21,252 | 1,459 | 1,618 | 159 |
| 1966 | 4,524 | 29,884 | 25,360 | 1,370 | 1,673 | 303 |
| 1967 | 4,409 | 31,142 | 26,733 | 1,961 | 2,248 | 287 |
| 1968 | 1,133 | 34,199 | 33,066 | 2,661 | 2,994 | 333 |
| 1969 | 1,599 | 37,462 | 35,863 | 2,831 | 3,138 | 307 |
| 1970 | 2,834 | 42,590 | 39,756 | 3,097 | 3,405 | 308 |
| 1971 | (2,024)[b] | 43,492 | 45,516 | 3,830 | 4,203 | 373 |
| 1972 | (6,351) | 48,959 | 55,310 | 3,230 | 3,795 | 565 |
| 1973 | 1,222 | 70,246 | 69,024 | 4,360 | 5,142 | 782 |
| 1974 | (2,996) | 97,144 | 100,140 | 6,350 | 7,095 | 745 |
| 1975 | 9,630 | 106,561 | 96,931 | 7,045 | 7,792 | 747 |
| 1976 | (7,786) | 113,666 | 121,452 | 7,267 | 7,843 | 576 |
| 1977 | (28,970) | 119,006 | 147,976 | 6,850 | 7,581 | 731 |
| 1978 | (33,541) | 141,228 | 174,769 | 9,058 | 10,001 | 943 |
| 1979 | (30,272) | 178,798 | 209,070 | 10,123 | 11,747 | 1,624 |
| 1980 | (27,336) | 216,672 | 244,008 | 11,952 | 15,506 | 3,554 |
| 1981 | (30,051) | 228,961 | 259,012 | 13,134 | 17,634 | 4,500 |
| 1982 | (35,182) | 207,158 | 242,340 | 11,035 | 15,603 | 4,568 |
| 1983 | (60,710) | 195,969 | 256,679 | 12,619 | 16,065 | 3,446 |
| 1984 | (110,932) | 212,057 | 322,989 | 10,082 | 15,008 | 4,926 |
| 1985 | (136,627) | 206,925 | 343,552 | 12,592 | 18,724 | 6,132 |
| 1986 | (162,281) | 206,376 | 368,657 | 12,802 | 20,704 | 7,902 |
| 1987 | (158,207) | 243,859 | 402,066 | 16,019 | 23,924 | 7,905 |

Source: Bureau of the Census. "Highlights of U.S. Export and Import Trade," Report FT990 (Monthly). "U.S. Exports, Schedule B Commodity by Country," Report FT446 (Annually). "U.S. Imports for Consumption and General Imports, TSUSA Commodity and Country of Origin," Report FT 246 (Annually).

a Total U.S. and aerospace foreign trade are reported as (1) exports of domestic merchandise, including Department of Defense shipments, f.a.s. (free alongside ship) basis, not seasonally adjusted; (2) imports for consumption, customs value basis, not seasonally adjusted; and (3) the difference (surplus or deficit) between exports and imports.

b First U.S. trade deficit since 1888.

r Revised.

## U.S. EXPORTS OF AEROSPACE PRODUCTS[a] BY MAJOR COUNTRIES OF DESTINATION

Calendar Years 1983-1987
(Millions of Dollars)

| Major Countries of Destination | 1983 | 1984 | 1985 | 1986 | 1987 |
|---|---|---|---|---|---|
| Australia | $ 390 | $ 445 | $1,034 | $1,327 | $1,036 |
| Belgium/Luxembourg | 281 | 247 | 216 | 345 | 373 |
| Brazil | 280 | 154 | 407 | 451 | 912 |
| Canada | 1,014 | 1,121 | 964 | 1,005 | 1,103 |
| China | 267 | 128 | 678 | 334 | 528 |
| France | 1,190 | 1,011 | 1,014 | 1,480 | 1,382 |
| Germany, West | 594 | 651 | 967 | 1,282 | 1,274 |
| Hong Kong | 121 | 110 | 140 | 266 | 351 |
| Israel | 430 | 444 | 333 | 304 | 487 |
| Italy | 323 | 469 | 725 | 533 | 455 |
| Japan | 1,540 | 1,305 | 1,792 | 2,209 | 2,313 |
| Korea, South | 274 | 382 | 536 | 301 | 343 |
| Netherlands | 401 | 331 | 217 | 625 | 565 |
| Saudi Arabia | 380 | 419 | 687 | 670 | 221 |
| Singapore | 549 | 691 | 641 | 529 | 498 |
| Spain | 147 | 93 | 115 | 204 | 447 |
| Sweden | 98 | 156 | 463 | 419 | 307 |
| Taiwan | 266 | 264 | 358 | 238 | 153 |
| United Kingdom | 1,087 | 1,276 | 1,566 | 1,301 | 2,297 |

Source: U.S. Department of Commerce, International Trade Administration
a Includes all civil products, f.a.s. basis; excludes military products, which are not reported by country of destination.

## U.S. IMPORTS OF AEROSPACE PRODUCTS[a] BY MAJOR COUNTRIES OF ORIGIN

Calendar Years 1983-1987
(Millions of Dollars)

| Major Countries of Origin | 1983 | 1984 | 1985 | 1986 | 1987 |
|---|---|---|---|---|---|
| Canada | $1,018 | $1,397 | $1,552 | $1,905 | $1,821 |
| France | 726 | 1,109 | 1,673 | 2,007 | 1,974 |
| Germany, West | 124 | 121 | 229 | 315 | 347 |
| Israel | 73 | 142 | 132 | 211 | 208 |
| Italy | 113 | 143 | 138 | 221 | 266 |
| Japan | 177 | 173 | 185 | 272 | 319 |
| Netherlands | 49 | 124 | 219 | 275 | 127 |
| Singapore | 36 | 100 | 114 | 121 | 115 |
| Sweden | 10 | 33 | 183 | 244 | 278 |
| United Kingdom | 933 | 1,163 | 1,562 | 1,898 | 2,004 |

Source: U.S. Department of Commerce, International Trade Administration
a Includes civil and military products, c.i.f. basis.

# U.S. IMPORTS OF AEROSPACE PRODUCTS

Calendar Years 1983-1987
(Millions of Dollars)

| Aerospace Imports | 1983 | 1984 | 1985 | 1986 | 1987 |
|---|---|---|---|---|---|
| **TOTAL** | $3,446 | $4,926 | $6,132 | $7,902 | $7,905 |
| **TOTAL CIVIL** | $2,927 | $3,787 | $4,984 | $6,398 | $6,409 |
| **Complete Aircraft—TOTAL** | $ 924 | $1,301 | $1,502 | $2,050 | $2,038 |
| Transports | 188 | 270 | 599 | 742 | 551 |
| General Aviation | 542 | 612 | 673 | 1,053 | 1,337 |
| Helicopters | 90 | 51 | 45 | 63 | 79 |
| Other, Including Used Aircraft, & Gliders, Balloons, & Airships | 104 | 368 | 185 | 192 | 70 |
| **Aircraft Engines—TOTAL** | 617 | 750 | 1,019 | 1,133 | 1,117 |
| Turbine Engines | 602 | 738 | 1,011 | 1,114 | 1,110 |
| Piston Engines | 15 | 12 | 8 | 19 | 7 |
| **Aircraft and Engine Parts—TOTAL** | 1,386 | 1,736 | 2,463 | 3,215 | 3,254 |
| Aircraft Parts and Accessories | 267 | 320 | 381 | 594 | 659 |
| Turbine Engine Parts | 452 | 561 | 851 | 1,053 | 1,058 |
| Piston Engine Parts | 5 | 6 | 14 | 12 | 19 |
| Spacecraft Parts, & Other Parts & Accessories | 662 | 849 | 1,217 | 1,556 | 1,519 |
| **TOTAL MILITARY** | $ 519 | $1,139 | $1,148 | $1,504 | $1,496 |
| **Complete Aircraft—TOTAL** | $ 3 | $ 14 | $ 20 | $ 35 | $ 33 |
| **Aircraft Engines—TOTAL** | 4 | 124 | 217 | 286 | 199 |
| Turbine Engines | 3 | 123 | 215 | 283 | 196 |
| Piston Engines Including Parts | 1 | 1 | 2 | 3 | 3 |
| **Aircraft and Engine Parts—TOTAL** | 512 | 1,001 | 911 | 1,183 | 1,265 |
| Aircraft Parts | 442 | 632 | 493 | 690 | 699 |
| Turbine Engine Parts | 52 | 163 | 228 | 317 | 370 |
| Other Parts & Accessories | 18 | 206 | 190 | 176 | 196 |

Source: Bureau of the Census, U.S. Imports for Consumption and General Imports, TSUSA Commodity and Country of Origin, Report FT 246 (Annually).
NOTE: Detail may not add to totals because of rounding.

## U.S. IMPORTS OF COMPLETE AIRCRAFT

Calendar Years 1983-1987

| Aircraft Imports | 1983 | 1984 | 1985 | 1986 | 1987 |
|---|---|---|---|---|---|
| **TOTAL NUMBER OF AIRCRAFT** | 693 | 995 | 1,241 | 797 | 816 |
| **Civil Aircraft—TOTAL** | 679 | 951 | 1,166 | 742 | 630 |
| New Complete Aircraft: | | | | | |
| Helicopters | 100 | 61 | 60 | 87 | 98 |
| General Aviation: | | | | | |
| Single-Engine | 6 | 21 | 46 | 71 | 41 |
| Multi-Engine Under 4400 lbs | 18 | 33 | 8 | 18 | 1 |
| Multi-Engine 4400-10,000 lbs | 52 | 58 | 46 | 58 | 81 |
| Multi-Engine, Turbojet Turbofan, 10,000-33,000 lbs | 86 | 61 | 54 | 63 | 76 |
| Multi-Engine, Other, Including Turboshaft, 10,000-33,000 lbs | | 34 | 49 | 87 | 79 |
| Transports (Multi-Engine, Over 33,000 lbs) | 7 | 12 | 29 | 36 | 22 |
| Other Civil Aircraft: | | | | | |
| Used or Rebuilt | 181 | 223 | 246 | 141 | 115 |
| Aircraft Previously Exported from U.S. | NA | NA | NA | NA | NA |
| Gliders | 229 | 448 | 628 | 181 | 117 |
| Balloons & Airships | NA | NA | NA | NA | NA |
| **Military Aircraft—TOTAL** | 14 | 44 | 75 | 55 | 186 |
| New Complete Aircraft | 7 | 43 | 66 | 47 | 123 |
| Gliders | 7 | 1 | 9 | 8 | 63 |
| Balloons & Airships | NA | NA | NA | NA | NA |

(Continued on next page)

## U.S. IMPORTS OF COMPLETE AIRCRAFT
(Continued)

| Aircraft Imports | 1983 | 1984 | 1985 | 1986 | 1987 |
|---|---|---|---|---|---|
| **TOTAL VALUE OF AIRCRAFT (Millions of Dollars)** | $926.8 | $1,314.6 | $1,522.0 | $2,084.5 | $2,070.4 |
| **Civil Aircraft—TOTAL** | $923.8 | $1,300.5 | $1,501.6 | $2,049.6 | $2,037.7 |
| New Complete Aircraft: | | | | | |
| Helicopters | 89.5 | 51.3 | 44.7 | 62.6 | 79.3 |
| General Aviation: | | | | | |
| Single-Engine | 0.4 | 1.5 | 7.5 | 8.1 | 3.1 |
| Multi-Engine Under 4400 lbs | 2.5 | 4.2 | 1.5 | 1.5 | 0.3 |
| Multi-Engine 4400-10,000 lbs | 72.6 | 100.1 | 95.1 | 134.9 | 206.7 |
| Multi-Engine, Turbojet/Turbofan, 10,000-33,000 lbs | 466.4 | 343.8 | 313.1 | 433.5 | 677.3 |
| Multi-Engine, Other, Including Turboshaft, 10,000-33,000 lbs | | 162.1 | 255.6 | 475.5 | 449.8 |
| Transports (Multi-Engine, Over 33,000 lbs) | 188.0 | 269.7 | 598.8 | 741.8 | 551.1 |
| Other Civil Aircraft: | | | | | |
| Used or Rebuilt | 72.8 | 351.8 | 177.2r | 189.0 | 60.7 |
| Aircraft Previously Exported from U.S. | 27.9 | 8.8 | — | — | 8.0 |
| Gliders | 3.5 | 3.6 | 3.8 | 1.7 | 0.6 |
| Balloons & Airships | 0.2 | 3.6 | 4.4 | 0.9 | 0.9 |
| **Military Aircraft—TOTAL** | 3.0 | 14.1 | 20.4 | 34.9 | 32.7 |
| New Complete Aircraft | 2.7 | 14.0 | 19.4 | 34.0 | 29.8 |
| Gliders | 0.2 | (a) | 0.2 | 0.8 | 1.3 |
| Balloons & Airships | 0.1 | 0.1 | 0.8 | 0.1 | 1.6 |

Source: Bureau of the Census, U.S. Imports for Consumption and General Imports, TSUSA Commodity and Country of Origin, Report FT 246 (Annually).

NA Not available
(a) Less than $50,000
r Revised

## TOTAL U.S. EXPORTS AND EXPORTS OF AEROSPACE PRODUCTS

Calendar Years 1963-1987
(Millions of Dollars)

| Year | TOTAL Exports[a] of U.S. Merchandise | Exports of Aerospace Products | | | | |
|---|---|---|---|---|---|---|
| | | TOTAL | Percent of Total U.S. Exports | Civil | | Military |
| | | | | Total | Transports | |
| 1963 | $ 23,062 | $ 1,627 | 7.1% | $ 732 | $ 191 | $ 895 |
| 1964 | 26,156 | 1,608 | 6.1 | 764 | 211 | 844 |
| 1965 | 27,127 | 1,618 | 6.0 | 854 | 353 | 764 |
| 1966 | 29,884 | 1,673 | 5.0 | 1,035 | 421 | 638 |
| 1967 | 31,142 | 2,248 | 7.2 | 1,380 | 611 | 868 |
| 1968 | 34,199 | 2,994 | 8.8 | 2,289 | 1,200 | 705 |
| 1969 | 37,462 | 3,138 | 8.4 | 2,027 | 947 | 1,111 |
| 1970 | 42,590 | 3,405 | 8.0 | 2,516 | 1,283 | 889 |
| 1971 | 43,492 | 4,203 | 9.7 | 3,080 | 1,567 | 1,123 |
| 1972 | 48,959 | 3,795 | 7.8 | 2,954 | 1,119 | 841 |
| 1973 | 70,246 | 5,142 | 7.3 | 3,788 | 1,664 | 1,354 |
| 1974 | 97,144 | 7,095 | 7.3 | 5,273 | 2,655 | 1,822 |
| 1975 | 106,561 | 7,792 | 7.3 | 5,324 | 2,397 | 2,468 |
| 1976 | 113,666 | 7,843 | 6.9 | 5,677 | 2,468 | 2,166 |
| 1977 | 119,006 | 7,581 | 6.4 | 5,049 | 1,936 | 2,532 |
| 1978 | 141,228 | 10,001 | 7.1 | 6,018 | 2,558 | 3,983 |
| 1979 | 178,798 | 11,747 | 6.6 | 9,772 | 4,998 | 1,975 |
| 1980 | 216,672 | 15,506 | 7.2 | 13,248 | 6,727 | 2,258 |
| 1981 | 228,961 | 17,634 | 7.7 | 13,312 | 7,180 | 4,322 |
| 1982 | 207,158 | 15,603 | 7.5 | 9,608 | 3,834 | 5,995 |
| 1983 | 195,969 | 16,065 | 8.2 | 10,595 | 4,683 | 5,470 |
| 1984 | 212,057 | 15,008 | 7.1 | 9,659 | 3,195 | 5,350 |
| 1985 | 206,925 | 18,724 | 9.0 | 12,919 | 5,518 | 5,805 |
| 1986r | 206,376 | 20,704 | 10.0 | 14,834 | 6,276 | 5,870 |
| 1987 | 243,859 | 23,924 | 9.8 | 16,183 | 6,377 | 7,741 |

Source: Bureau of the Census. "U.S. Exports, Schedule B, Commodity by Country," Report FT 446 (Annually). "Highlights of U.S. Export and Import Trade," Report FT 990 (Monthly).

NOTE: Detail may not add to totals because of rounding.

a Exports of domestic merchandise including DOD shipments.

r Revised.

# U.S. EXPORTS OF AEROSPACE PRODUCTS

Calendar Years 1983-1987
(Millions of Dollars)

| Aerospace Exports | 1983 | 1984 | 1985 | 1986 | 1987 |
|---|---|---|---|---|---|
| **TOTAL** | $16,065 | $15,008 | $18,724 | $20,704r | $23,924 |
| **TOTAL CIVIL** | $10,595 | $ 9,659 | $12,919 | $14,833 | $16,183 |
| **Complete Aircraft—TOTAL** | $ 5,691 | $ 4,147 | $ 6,694 | $7,365 | $ 7,649 |
| Transports | 4,683 | 3,195 | 5,518 | 6,276 | 6,377 |
| General Aviation[a] | 356 | 268 | 191 | 243 | 327 |
| Helicopters | 232 | 234 | 210 | 277 | 239 |
| Other, Including Used | 420 | 450 | 775 | 569 | 706 |
| **Aircraft Engines—TOTAL** | 950 | 1,057 | 923 | 987 | 1,326 |
| Turbine Engines | 914 | 1,021 | 880 | 944 | 1,269 |
| Piston Engines | 36 | 36 | 43 | 43 | 57 |
| **Aircraft and Engine Parts Incl. Spares—TOTAL** | 3,954 | 4,455 | 5,302 | 6,481 | 7,208 |
| Aircraft Parts & Accessories | 2,742 | 3,094 | 3,610 | 4,394 | 4,752 |
| Aircraft Engine Parts | 1,212 | 1,361 | 1,692 | 2,087 | 2,456 |
| **TOTAL MILITARY** | $ 5,470 | $ 5,350 | $5,805 | $5,871r | $ 7,741 |
| **Complete Aircraft—TOTAL[b]** | $ 1,845 | $ 1,581 | $ 2,011 | $ 2,479r | $ 3,590 |
| Fighters & Fighter Bombers | 1,379 | 977 | 1,352 | 1,016 | 1,986 |
| Transports | 112 | 85 | 101 | 1,133 | 1,324 |
| Helicopters | 62 | 83 | 117 | 123 | 81 |
| Other, Including Used | 292 | 436 | 441 | 207 | 200 |
| **Aircraft Engines—TOTAL** | 172 | 141 | 146 | 111 | 161 |
| Turbine Engines | 162 | 125 | 144 | 108 | 157 |
| Piston Engines | 10 | 16 | 2 | 3 | 4 |
| **Aircraft and Engine Parts Incl. Spares—TOTAL** | 2,459 | 2,666 | 2,823 | 2,624 | 3,142 |
| Aircraft Parts & Accessories | 2,058 | 2,241 | 2,302 | 2,148 | 2,500 |
| Aircraft Engine Parts | 401 | 425 | 521 | 476 | 642 |
| **Guided Missiles, Rockets, & Parts—TOTAL** | 994 | 962 | 825 | 657 | 848 |
| Guided Missiles & Rockets | 443 | 288 | 404 | 303 | 353 |
| Missile & Rocket Parts | 499 | 646 | 387 | 321 | 456 |
| Missile & Rocket Engines | 28 | 16 | 14 | 17 | 21 |
| Missile & Rocket Engine Parts | 24 | 12 | 20 | 16 | 18 |

Source: Bureau of the Census, "U.S. Exports, Schedule B: Commodity by Country," Report FT 446 (Annually).
a. All fixed-wing aircraft under 33,000 pounds.
b. Includes aircraft exported under Military Assistance Programs and Foreign Military Sales.
r. Revised.

## U.S. EXPORTS OF CIVIL AIRCRAFT

Calendar Years 1983-1987

| Civil Aircraft Exports | 1983 | 1984 | 1985 | 1986 | 1987 |
|---|---|---|---|---|---|
| **TOTAL NUMBER OF AIRCRAFT** | 1,088 | 1,045 | 1,050 | 1,327 | 1,929 |
| **Helicopters—TOTAL** | 216 | 233 | 137 | 210 | 281 |
| Under 2200 lbs | 141 | 155 | 68 | 104 | 129 |
| Over 2200 lbs | 75 | 78 | 69 | 106 | 152 |
| **General Aviation—TOTAL** | 519 | 425 | 484 | 464 | 509 |
| Single-Engine | 279 | 271 | 334 | 270 | 307 |
| Multi-Engine, Under 4400 lbs | 106 | 53 | 66 | 63 | 51 |
| Multi-Engine, 4400-10,000 lbs | 112 | 83 | 65 | 93 | 127 |
| Multi-Engine, 10,000-33,000 lbs | 22 | 18 | 19 | 38 | 24 |
| **Transports—TOTAL** | 129 | 83 | 152 | 159 | 170 |
| Passenger Aircraft, Over 33,000 lbs | 122 | 77 | 140 | 149 | 160 |
| Cargo Aircraft, Over 33,000 lbs | 2 | 3 | 6 | 2 | 4 |
| Other, Over 33,000 lbs, Incl Pass. Cargo Combi | 5 | 3 | 6 | 8 | 6 |
| **Other Aircraft—TOTAL** | 224 | 304 | 277 | 494 | 969 |
| Used or Rebuilt Aircraft | 224 | 304 | 277 | 494 | 969 |
| Other Aircraft, Including Balloons, Gliders & Kites | NA | NA | NA | NA | NA |
| **TOTAL VALUE (Millions of Dollars)** | $5,691 | $4,147 | $6,694 | $7,366 | $7,649 |
| **Helicopters—TOTAL** | $ 232 | $ 234 | $ 210 | $ 277 | $ 239 |
| Under 2200 lbs | 35 | 45 | 18 | 29 | 33 |
| Over 2200 lbs | 197 | 189 | 192 | 248 | 206 |
| **General Aviation—TOTAL** | 356 | 268 | 191 | 243 | 327 |
| Single-Engine | 23 | 34 | 48 | 28 | 28 |
| Multi-Engine, Under 4400 lbs | 21 | 13 | 14 | 13 | 8 |
| Multi-Engine, 4400-10,000 lbs | 155 | 99 | 85 | 133 | 219 |
| Multi-Engine, 10,000-33,000 lbs | 157 | 122 | 44 | 69 | 72 |
| **Transports—TOTAL** | 4,683 | 3,195 | 5,518 | 6,276 | 6,377 |
| Passenger Aircraft, Over 33,000 lbs | 4,415 | 2,998 | 4,643 | 5,352 | 5,635 |
| Cargo Aircraft, Over 33,000 lbs | 37 | 62 | 334 | 186 | 208 |
| Other, Over 33,000 lbs, Incl Pass. Cargo Combi | 231 | 135 | 541 | 738 | 534 |
| **Other Aircraft—TOTAL** | 420 | 450 | 775 | 569 | 706 |
| Used or Rebuilt | 298 | 293 | 333 | 501 | 563 |
| Other, Including Balloons, Gliders & Kites | 122 | 157 | 442 | 68 | 143 |

Source: Bureau of the Census, U.S. Exports, Schedule B, Commodity by Country, Report FT446 (Annually)
NA: Not available

## U.S. EXPORTS OF CIVIL HELICOPTERS

Calendar Years 1983-1987

| Region of Destination | 1983 | 1984 | 1985 | 1986 | 1987 |
|---|---|---|---|---|---|
| **TOTAL NUMBER EXPORTED** | 216 | 233 | 137 | 210 | 281 |
| Canada & Greenland | 16 | 8 | 12 | 12 | 16 |
| Latin America & Caribbean | 38 | 32 | 25 | 39 | 58 |
| Europe | 51 | 89 | 18 | 45 | 105 |
| Middle East | 48 | 12 | 6 | 26 | 16 |
| Asia | 44 | 62 | 51 | 54 | 47 |
| Oceania | 8 | 25 | 18 | 19 | 32 |
| Africa | 11 | 5 | 7 | 15 | 7 |
| **TOTAL VALUE (Millions of Dollars)** | $232.1 | $233.8 | $209.8 | $277.3 | $239.1 |
| Canada & Greenland | $ 9.7 | $ 4.1 | $ 5.0 | $ 3.2 | $ 7.3 |
| Latin America & Caribbean | 47.0 | 42.0 | 19.0 | 24.4 | 68.0 |
| Europe | 50.7 | 52.8 | 5.4 | 25.6 | 41.5 |
| Middle East | 48.6 | 16.3 | 24.5 | 78.7 | 61.3 |
| Asia | 59.2 | 107.5 | 141.1 | 125.7 | 48.4 |
| Oceania | 1.1 | 9.3 | 9.5 | 7.8 | 8.6 |
| Africa | 15.8 | 1.8 | 5.3 | 11.9 | 4.0 |

Source: Bureau of the Census, "U.S. Exports, Schedule B, Commodity by Country," Report FT446 (Annually).

## U.S. IMPORTS OF CIVIL HELICOPTERS

Calendar Years 1983-1987

| Country of Origin | 1983 | 1984 | 1985 | 1986 | 1987 |
|---|---|---|---|---|---|
| **TOTAL NUMBER IMPORTED** | 100 | 61 | 60 | 87 | 98 |
| Canada | — | — | — | — | 32 |
| France | 46 | 13 | 13 | 21 | 29 |
| Germany | 48 | 16 | 35 | 55 | 33 |
| Italy | 1 | 30 | 8 | 8 | 4 |
| United Kingdom | 5 | 2 | 4 | 3 | — |
| **TOTAL VALUE (Millions of Dollars)** | $ 89.5 | $51.3 | $44.7 | $62.6 | $ 79.3 |
| Canada | $ — | $ — | $ — | $ — | $ 18.9 |
| France | 39.6 | 14.9 | 13.7 | 10.8 | 24.0 |
| Germany | 35.8 | 9.7 | 19.9 | 43.9 | 31.2 |
| Italy | 0.8 | 19.2 | 3.9 | 5.7 | 5.2 |
| United Kingdom | 13.3 | 7.5 | 7.2 | 2.2 | — |

Source: Bureau of the Census, "U.S. Imports for Consumption and General Imports, TSUSA Commodity and Country of Origin," Report FT246 (Annually).

## U.S. EXPORTS OF GENERAL AVIATION AIRCRAFT[a]

Calendar Years 1983-1987

| Region of Destination | 1983 | 1984 | 1985 | 1986 | 1987 |
|---|---|---|---|---|---|
| **TOTAL NUMBER EXPORTED** | 519 | 425 | 484 | 464 | 509 |
| Canada & Greenland | 43 | 49 | 44 | 50 | 32 |
| Latin America & Caribbean | 204 | 108 | 175 | 166 | 97 |
| Europe | 102 | 113 | 111 | 146 | 226 |
| Middle East | 13 | 10 | 33 | 8 | 1 |
| Asia | 30 | 47 | 35 | 42 | 69 |
| Oceania | 43 | 62 | 49 | 33 | 41 |
| Africa | 84 | 36 | 37 | 19 | 43 |
| **TOTAL VALUE (Millions of Dollars)** | $356.0 | $267.8 | $191.1 | $243.1 | $327.3 |
| Canada & Greenland | $ 13.6 | $ 23.7 | $ 15.1 | $ 10.5 | $ 17.2 |
| Latin America & Caribbean | 66.0 | 33.3 | 44.0 | 48.6 | 51.5 |
| Europe | 92.9 | 60.6 | 57.2 | 92.6 | 150.6 |
| Middle East | 86.2 | 62.2 | 3.9 | 6.8 | 0.1 |
| Asia | 31.4 | 48.1 | 40.4 | 48.8 | 60.9 |
| Oceania | 16.1 | 8.6 | 19.4 | 16.7 | 3.3 |
| Africa | 49.8 | 31.3 | 11.1 | 19.0 | 43.7 |

Source: Bureau of the Census, "U.S. Exports, Schedule B, Commodity by Country," Report FT446 (Annually).
a. All fixed-wing aircraft under 33,000 pounds.

## U.S. IMPORTS OF GENERAL AVIATION AIRCRAFT

Calendar Years 1983-1987

| Country of Origin | 1983 | 1984 | 1985 | 1986 | 1987 |
|---|---|---|---|---|---|
| **TOTAL NUMBER IMPORTED** | 162 | 207 | 203 | 297 | 278 |
| Brazil | 15 | 14 | 10 | 13 | 20 |
| Canada | 38 | 27 | 26 | 34 | 34 |
| France | 19 | 30 | 49 | 99 | 76 |
| Israel | 9 | 24 | 9 | 13 | 8 |
| Japan | 17 | 15 | 8 | 10 | 12 |
| Netherlands | — | 3 | 6 | 10 | — |
| United Kingdom | 36 | 53 | 58 | 79 | 80 |
| Other | 28 | 41 | 37 | 39 | 48 |
| **TOTAL VALUE (Millions of Dollars)** | $541.9 | $611.7 | $672.7 | $1,053.5 | $1,337.0 |
| Brazil | $ 26.9 | $ 23.9 | $ 26.3 | $ 62.8 | $ 97.8 |
| Canada | 208.4 | 159.6 | 173.1 | 229.8 | 209.6 |
| France | 104.3 | 95.7 | 83.9 | 196.1 | 510.5 |
| Israel | 31.7 | 85.2 | 33.0 | 54.8 | 30.7 |
| Japan | 16.2 | 14.8 | 7.7 | 8.6 | 12.6 |
| Netherlands | — | 18.2 | 35.0 | 56.9 | — |
| United Kingdom | 137.0 | 198.1 | 200.7 | 297.9 | 301.9 |
| Other | 17.4 | 16.2 | 113.0 | 146.6 | 173.9 |

Source: Bureau of the Census, "U.S. Imports for Consumption and General Imports, TSUSA Commodity and Country of Origin," Report FT246 (Annually).

## U.S. EXPORTS OF COMMERCIAL TRANSPORT AIRCRAFT

33,000 Pounds and Over Airframe Weight
Calendar Years 1983-1987

| Region of Destination | 1983 | 1984 | 1985 | 1986 | 1987 |
|---|---|---|---|---|---|
| **TOTAL NUMBER EXPORTED** | 129 | 83 | 152 | 159 | 170 |
| Canada | 8 | 6 | 4 | 2 | — |
| Latin America & Caribbean | 8 | 3 | 4 | 9 | 20 |
| Europe | 57 | 34 | 72 | 69 | 88 |
| Middle East | 10 | 9 | 8 | 11 | 7 |
| Asia | 30 | 23 | 49 | 35 | 40 |
| Oceania | 4 | 2 | 7 | 30 | 8 |
| Africa | 12 | 6 | 8 | 3 | 7 |
| **TOTAL VALUE (Millions of Dollars)** | $4,683 | $3,195 | $5,518 | $6,276 | $6,377 |
| Canada | $ 280 | $ 265 | $ 84 | $ 46 | $ — |
| Latin America & Caribbean | 304 | 69 | 234 | 343 | 725 |
| Europe | 1,785 | 1,008 | 2,050 | 2,284 | 2,753 |
| Middle East | 291 | 242 | 438 | 613 | 185 |
| Asia | 1,464 | 1,165 | 2,124 | 1,957 | 2,263 |
| Oceania | 180 | 137 | 437 | 927 | 289 |
| Africa | 379 | 309 | 151 | 104 | 162 |

Source: Bureau of the Census, "U.S. Exports, Schedule B, Commodity by Country," Report FT446 (Annually).

## U.S. EXPORTS OF MILITARY AIRCRAFT[a]

Calendar Years 1983-1987

| | 1983 | 1984 | 1985 | 1986 | 1987 |
|---|---|---|---|---|---|
| **TOTAL NUMBER OF AIRCRAFT** | 936 | 381 | 313 | 409 | 500 |
| Fighters & Fighter Bombers | 93 | 110 | 91 | 68 | 122 |
| Transports | 15 | 6 | 6 | 15 | 106 |
| Helicopters | 55 | 32 | 38 | 45 | 39 |
| New Aircraft, NEC | 124 | 227 | 141 | 271 | 218 |
| Used or Rebuilt Aircraft | 649 | 6 | 37 | 10 | 15 |
| Airships, Balloons, Gliders, etc. | NA | NA | NA | NA | NA |
| **TOTAL VALUE (Millions of Dollars)** | $1,845 | $1,581 | $2,011 | $2,479 | $3,590 |
| Fighters & Fighter Bombers | $1,378 | $ 977 | $1,352 | $1,016 | $1,986 |
| Transports | 112 | 85 | 101 | 1,133 | 1,324 |
| Helicopters | 62 | 83 | 117 | 123 | 81 |
| New Aircraft, NEC | 248 | 410 | 357 | 178 | 135 |
| Used or Rebuilt Aircraft | 22 | 6 | 59 | 6 | 6 |
| Airships, Balloons, Gliders, etc. | 23 | 20 | 25 | 23 | 59 |

Source: Bureau of the Census, "U.S. Exports, Schedule B, Commodity by Country," Report FT446 (Annually).
NEC Not elsewhere classified.
NA Not available.
a Includes aircraft exported under Military Assistance Programs and Foreign Military Sales.
r Revised.

## U.S. EXPORTS OF AIRCRAFT ENGINES

Calendar Years 1985-1987
(Millions of Dollars)

| | 1985 | | 1986 | | 1987 | |
|---|---|---|---|---|---|---|
| | umber | Value | Number | Value | Number | Value |
| **TOTAL** | 6,577 | $1,069 | 4,582 | $1,098 | 5,820 | $1,486 |
| **Turbine Engines-New** | 1,942 | $ 699 | 801 | $ 630 | 1,004 | $ 779 |
| Civil | 1,748 | 570 | 702 | 531 | 877 | 654 |
| Military | 194 | 129 | 99 | 99 | 127 | 125 |
| **Turbine Engines-Used** | 619 | 325 | 676 | 422 | 1,578 | 646 |
| Civil | 569 | 310 | 640 | 413 | 1,513 | 614 |
| Military | 50 | 15 | 36 | 9 | 65 | 32 |
| **Piston Engines** | 4,016 | 45 | 3,105 | 46 | 3,238 | 61 |
| Civil, New, Under 500 HP | 854 | 11 | 851 | 13 | 946 | 13 |
| Civil, New, Over 500 HP | 1,688 | 8 | 695 | 9 | 295 | 16 |
| Civil, Used | 1,402 | 24 | 1,415 | 21 | 1,747 | 28 |
| Military | 72 | 2 | 144 | 3 | 250 | 4 |

Source: Bureau of the Census, "U.S. Exports, Schedule B, Commodity by Country," Report FT446 (Annually).

## U.S. IMPORTS OF TURBINE AIRCRAFT ENGINES[a]

Calendar Years 1985-1987
(Millions of Dollars)

| | 1985 | | 1986 | | 1987 | |
|---|---|---|---|---|---|---|
| | Number | Value | Number | Value | Number | Value |
| **Turbine Engines** | 2,010 | $1,226 | 2,274 | $1,397 | $2,136 | $1,306 |
| Civil | 1,760 | 1,011 | 1,829 | 1,114 | 1,656 | 1,110 |
| Military | 250 | 215 | 445 | 283 | 480 | 196 |

Source: Bureau of the Census, "U.S. Imports for Consumption and General Imports, TSUSA Commodity and Country of Origin," Report FT246 (Annually).

a New and used.

# EXPORT-IMPORT BANK LENDING AUTHORITY AND GROSS AUTHORIZATIONS SUMMARY

Fiscal Years 1979-1988
(Millions of Dollars)

## LOANS[a]

| Year | Lending Authority[b] | Authorizations Summary | | | | |
|---|---|---|---|---|---|---|
| | | TOTAL Direct Loans[f] | Regular Loans | | | Discount Loans, Medium Term, and Small Business Credits |
| | | | Total Regular Loans[f] | Direct Credits | CFF[c] & Relending | |
| 1979 | $3,750 | $4,475 | $3,825 | $3,725 | $100 | $ 650 |
| 1980 | 4,001 | 4,578 | 4,087 | 4,045 | 42 | 491 |
| 1981 | 5,461 | 5,431 | 5,079 | 5,045 | 34 | 352 |
| 1982 | 4,400 | 3,516 | 3,104 | 3,104 | (b) | 412 |
| 1983 | 4,400 | 845 | 685 | 685 | (b) | 160 |
| 1984 | 3,865 | 1,465 | 1,122 | 1,122 | (b) | 343 |
| 1985 | 3,865 | 659 | 320 | 320 | (b) | 339 |
| 1986 | 1,059 | 578 | 371 | 371 | (b) | 207 |
| 1987 | 680 | 599 | 332 | 332 | — | 267 |
| 1988[E] | 693 | NA | NA | NA | — | NA |

## GUARANTEES AND INSURANCE

| Year | Lending Authority | Authorizations Summary | | |
|---|---|---|---|---|
| | | TOTAL Guarantees and Insurance | Guarantees | Insurance |
| 1979 | $ (d) | $5,016 | $ 908 | $4,108 |
| 1980 | (d) | 8,032 | 2,510 | 5,522 |
| 1981 | 8,059 | 7,416 | 1,506 | 5,910 |
| 1982 | 9,220 | 5,832 | 727 | 5,105 |
| 1983 | 9,000 | 8,525 | 1,741 | 6,784 |
| 1984 | 10,000 | 7,151 | 1,333 | 5,818 |
| 1985 | 10,000 | 7,850 | 1,320 | 6,530 |
| 1986 | 11,484[f] | 5,508 | 1,128 | 4,380 |
| 1987 | 11,355 | 7,958 | 1,514 | 6,444 |
| 1988[E] | 14,602 | NA | NA | NA |

Source: Export-Import Bank of the United States.
NOTE: Detail may not add to totals because of rounding.

a Discount Loans excluded from loan lending authority limitation until FY 1981. Comparable authorization data for 1980 and prior years are therefore listed under Total Regular Loans, which include Direct Credits, CFF and Relending Loans. For 1981 and subsequent years, compare TOTAL Direct Loans authorization data with Lending Authority, both of which include Discount Loans. The value of Loans may exceed Lending Authority because of the inclusion in Loans of the full amount of Certificates of Loan Participation (COLPs), portions of which are subsequently sold to commercial banks.

b CFF (Cooperative Financing Facility) program discontinued after 1981.

c Effective 1981, lending authority includes discount loans as well as direct loans.

d Limitation for Guarantees and Insurance began in 1981.

E Estimate. Latest year represents Administration's budget proposal.

f Includes $1,800 million proposed I-MATCH Program, which would replace direct lending and would allow an estimated $100 million in commercial loan interest buy-down.

NA Not available.

## EXPORT-IMPORT BANK
## TOTAL AUTHORIZATIONS OF LOANS AND GUARANTEES AND AUTHORIZATIONS IN SUPPORT OF AIRCRAFT EXPORTS[r]

Fiscal Years 1978-1987
(Millions of Dollars)

| Year | TOTAL AUTHORIZATIONS | Authorizations in Support of Aircraft Exports | | | |
|---|---|---|---|---|---|
| | | TOTAL | Percent of TOTAL Authorizations | Commercial Jet Aircraft[a] | Other Aircraft[b] |
| **LOANS**[c] | | | | | |
| 1978 | $3,425 | $ 237.8 | 6.9% | $ 189.5 | $ 48.3 |
| 1979 | 4,475 | 1,469.4 | 32.8 | 1,399.4 | 70.0 |
| 1980 | 4,578 | 1,743.3 | 38.1 | 1,692.6 | 50.7 |
| 1981 | 5,431 | 2,576.6 | 47.4 | 2,550.3 | 26.3 |
| 1982 | 3,516 | 263.9 | 7.5 | 199.1 | 64.8 |
| 1983 | 845 | 396.7 | 46.9 | 383.8 | 12.9 |
| 1984 | 1,465 | 607.0 | 41.5 | 531.8 | 76.2 |
| 1985 | 659 | 39.7 | 6.0 | 15.2 | 24.5 |
| 1986 | 578 | 54.6 | 9.4 | 46.3 | 8.3 |
| 1987 | 599 | 12.1 | 2.0 | — | 12.1 |
| **GUARANTEES**[d] | | | | | |
| 1978 | $ 589 | $ 97.6 | 16.6% | $ 77.2 | $ 20.4 |
| 1979 | 908 | 261.4 | 28.8 | 239.3 | 22.1 |
| 1980 | 2,510 | 1,131.9 | 45.1 | 1,088.1 | 43.8 |
| 1981 | 1,506 | 562.6 | 37.4 | 533.4 | 29.2 |
| 1982 | 727 | 104.2 | 14.3 | 78.4 | 25.8 |
| 1983 | 1,741 | 629.6 | 36.2 | 601.3 | 28.3 |
| 1984 | 1,333 | 355.5 | 26.7 | 293.5 | 62.0 |
| 1985 | 1,320 | 322.4 | 24.4 | 290.0 | 32.4 |
| 1986 | 1,125 | 329.2 | 29.2 | 277.4 | 51.8 |
| 1987 | 1,514 | 808.3 | 53.4 | 768.1 | 40.2 |

Source: Export-Import Bank of the United States.

a Includes complete aircraft, leased engines and parts, and rotables.

b Includes business aircraft, general aviation aircraft, helicopters, and related goods and services. Data revised to include Discount Loans.

c Loans are commitments for financing by the Export-Import Bank to foreign buyers of U.S. equipment and services, including Direct Credits, loans authorized under the Cooperative Financing Facility (CFF), (until the termination of the CFF program in 1981), and Discount Loans, which are made by the Export-Import Bank to commercial banks and which subsequently may be guaranteed by the Export-Import Bank, in which case the value of the loans is also included with Guarantees.

d Guarantees by the Export-Import Bank provide assurances of repayment of principal and interest on loans made by private lending institutions, such as commercial banks, for major export transactions. Excludes insurance.

r Revised to include Discount Loans and corrected data.

# EXPORT-IMPORT BANK
## SUMMARY OF COMMERCIAL JET AIRCRAFT AUTHORIZATIONS FOR LOANS[a] AND GUARANTEES[b]

Fiscal Years 1957-1987
(Values in Millions of Dollars)

| Year | No. of Jet Aircraft[c] | | Export Value[c] | | No. of New Commitments | | Gross Authorizations | |
|---|---|---|---|---|---|---|---|---|
| | Loans | Guarantees | Loans | Guarantees | Loans | Guarantees | Loans | Guarantees |
| New Authorizations: | | | | | | | | |
| 1957[d]-1969 | 377 | 76 | $ 3,023 | $ 538 | 115 | 76 | $ 1,717 | $ 385 |
| 1970 | 142 | 1 | 1,749 | 3 | 44 | 38 | 598 | 79 |
| 1971 | 126 | 9 | 1,539 | 40 | 58 | 49 | 481 | 363 |
| 1972 | 145 | 2 | 1,334 | 9 | 44 | 29 | 475 | 183 |
| 1973 | 129 | 4 | 1,729 | 25 | 60 | 23 | 690 | 191 |
| 1974 | 189 | — | 2,195 | — | 79 | 22 | 895 | 133 |
| 1975 | 136 | 1 | 2,070 | 5 | 64 | 10 | 691 | 64 |
| 1976 | 77 | 6 | 1,017 | 139 | 34 | 11 | 398 | 87 |
| Tr. Qtr. | 15 | 3 | 219 | 182 | 6 | 3 | 94 | 59 |
| 1977 | 31 | 25 | 330 | 902 | 16 | 14 | 138 | 294 |
| 1978 | 29 | 5 | 479 | 253 | 18 | 5 | 189 | 77 |
| 1979 | 118 | 7 | 2,938 | 317 | 35 | 10 | 1,399 | 239 |
| 1980 | 136 | 21 | 3,975 | 901 | 36 | 24 | 1,693 | 1,088 |
| 1981 | 121 | 18 | 4,568 | 637 | 26 | 17 | 2,550 | 533 |
| 1982 | 11 | 6 | 441 | 113 | 5 | 2 | 199 | 78 |
| 1983 | 21 | 9 | 779 | 619 | 3 | 4 | 384 | 601 |
| 1984 | 37 | 8 | 1,023 | 327 | 7 | 4 | 532 | 294 |
| 1985 | — | 14 | 19 | 481 | 1 | 5 | 13 | 289 |
| 1986 | 3 | 14 | 74 | 451 | 1 | 9 | 46 | 277 |
| 1987 | — | 32 | 22 | 1,449 | 5 | 14 | 12 | 808 |
| Cumulative New Authorizations | 1,843 | 262 | 29,522 | 7,396 | 657 | 369 | 13,194 | 6,123 |
| Transfers, Reversals & Participation | — | — | (8) | 8 | 4 | — | (140) | (20) |
| Cumulative Gross Authorizations (net of Adjustments)[r] | 1,843 | 262 | 29,514 | 7,400 | 661 | 369 | 13,054 | 6,103 |

Source: Export-Import Bank of the United States
NOTE: Detail may not add to totals because of rounding.
a. Loans are commitments for direct financing by the Export-Import Bank to foreign buyers of U.S. equipment and services, including Direct Credits and loans authorized under the Cooperative Financing Facility (CFF) until the termination of the CFF program in 1987, but excluding Discount Loans, which are made by the Export-Import Bank to commercial banks and which subsequently may be guaranteed by the Export-Import Bank, in which case the value of the loans is included with Guarantees.
b. Guarantees by the Export-Import Bank provide assurances of repayment of principal and interest on loans made by private lending institutions, such as commercial banks, for major export transactions.
c. For Export-Import Bank commitments including both loan and guarantee authorization, number of aircraft and export value reported under "Loans."
d. First year of commercial jet aircraft authorizations.
r. Revised.

## EXPORT-IMPORT BANK
## AUTHORIZATIONS OF LOANS AND GUARANTEES
## IN SUPPORT OF EXPORTS OF COMMERCIAL JET AIRCRAFT

Fiscal Years 1985-1987
(Values in Millions of Dollars)

| Customer (Country Airline) | Number and Aircraft Model or Related Product | Export Value | Authorization | | | | |
|---|---|---|---|---|---|---|---|
| | | | Loans (Direct Credits) | | | | Guarantees |
| | | | Amount | Percent Coverage | Interest Rate | Repayment Terms | Amount |
| **FY 1987** | | | | | | | |
| **TOTALS** | 32 aircraft | $1,411 | $ 7 | — | — | — | $768 |
| Brazil VARIG | 6 X 767 | 324 | — | — | — | — | 275 |
| Israel El Al | 2 X 757 | 59 | — | — | — | — | 50 |
| Japan All Nippon | 15 X 767 | 857 | — | — | — | — | 300 |
| Mauritius Air Mauritius | 2 X 767 | 5 | — | — | — | — | 5 |
| Mauritius Air Mauritius | spare parts for 2 X 767 | 16 | 7 | 42.5 | 9.10%[a] | 20-S | 7 |
| Nepal Royal Nepal Airlines | 2 X 757 | 76 | — | — | — | — | 64 |
| Yugoslavia Jugoslovenski Aerotransport | 2 X 737 | 53 | — | — | — | — | 45 |
| Yugoslavia Aviogenex | 2 x 737 | 18 | — | — | — | — | 14 |
| Yugoslavia Aviogenex | 1 X 737 | 19 | — | — | — | — | 15 |
| **FY 1986** | | | | | | | |
| **TOTALS** | 16 aircraft | $ 525.5 | $ 46.3 | — | — | — | $277.4 |
| Brazil Ministry of Aeronautics | tools for engine overhaul | 6.9 | — | — | — | — | 5.9 |
| Chile Lan-Chile, S.A. | 2 X 767 | 96.2 | — | — | — | — | 40.0 |
| Finland Finnair | 3 X MD-87 | 74.2 | 46.3 | 62.5 | 8.40 | 20-S | — |
| Gabon Air Gabon | 1 X 100-30 | 22.7 | — | — | — | — | 19.3 |
| Jamaica Air Jamaica | engines | 4.3 | — | — | — | — | 3.6 |
| Yugoslavia Inex Adria Airways | engines | 2.2 | — | — | — | — | 1.9 |
| Yugoslavia Boeing | 2 X 737 | 69.9 | — | — | — | — | 59.4 |
| Yugoslavia McDonnell Douglas | 1 x MD-82 | 21.8 | — | — | — | — | 18.6 |
| Zimbabwe Boeing | 3 X 737 | 66.2 | — | — | — | — | 56.2 |
| Japan All Nippon Airways | 4 X 767 | 161.1 | — | — | — | — | 72.5 |

(Continued on next page)

# EXPORT-IMPORT BANK
## LOAN AND GUARANTEE AUTHORIZATIONS (Continued)

| Customer (Country Airline) | Number and Aircraft Model or Related Product | Export Value | Authorization | | | | |
|---|---|---|---|---|---|---|---|
| | | | Loans (Direct Credits) | | | | Guarantees |
| | | | Amount | Percent Coverage[a] | Interest Rate | Repayment Terms[b] | Amount |
| FY 1985 | | | | | | | |
| TOTALS | 14 aircraft | $ 500.7 | $ 12.6 | — | — | — | $288.9 |
| Morocco Royal Air Maroc | — | — | — | — | — | — | (1.1) (c) |
| Japan All Nippon Airways | 8 X 767 engines | 297.8 19.4 | — 12.6 | — 65.0 | — 12.00 | — 20-S | 134.0 — |
| Yugoslavia Jugoslovenski Aerotransport Yugoslavia/ Inex Adria Aviopromet | 2 X 737 1 X DC-9 | 60.8 22.4 | — — | — — | — — | — — | 51.7 19.0 |
| Brazil Viacao Aerea Sao Paulo | engines | 25.1 | — | — | — | — | 21.4 |
| Mexico Aeronaves De Mexico | 3 X DC-9 | 75.2 | — | — | — | — | 63.9 |

Source: Aerospace Industries Association, based on data from the Export-Import Bank of the United States.
NOTE: For definitions of Loans and Guarantees see Export-Import Bank table on previous pages.
a Amount of loan as percent of export value.
b Number of payments and frequency (S - semi-annual).
c Reflects change from Exim guaranteed loan to commercial financing.

# Employment

The aerospace industry employment curve continued on the upward curve in evidence since 1983 but probably peaked in 1987. Aerospace Industries Association projected an employment decline of indefinite proportions, beginning in 1988, as the industry noted the first impacts of four consecutive negligible to negative growth defense budgets.

Aerospace employment averaged 1,309,000 in 1987, according to AIA estimates. That represented an increase of 4.6 percent over the previous year's average of 1,251,000.

In 1987, aerospace employment amounted to 6.8 percent of the total employment in all U.S. manufacturing industries, up from the previous year's 6.6 percent. It also represented 11.6 percent of total employment among U.S. companies producing durable goods; that figure compares with 11.1 percent in 1986.

As is traditional, more than half of the 1987 aerospace work force was employed by the segment of the industry manufacturing aircraft, engines and parts. Employment in that category totaled 692,000, up from 673,000 in 1986. Employment among companies engaged in fabrication of missiles and space systems averaged 210,000, up from 190,000. In the catch-all category that embraces all other aerospace R&D/manufacture, employment averaged 407,000, compared with 389,000 in the previous year.

The number of aerospace production workers increased across the board. There was a gain of 16,000, to a total of 344,000 in aircraft, engine and parts production workers; an increase of 4,000 (to 68,000) in missiles/space; and a gain of 1,000 (to 33,000) in the "other" category. The total increase in production workers was 23,000, to a total of 446,000.

The aerospace payroll for 1987 amounted to $34.0 billion, up 5.7 percent over the $32.2 billion paid in 1986; both figures include lump sum wage payments made by many aerospace firms in lieu of general wage or cost of living increases. The aerospace payroll represented seven percent of combined payroll outlays by all U.S. manufacturing industries.

Payments to production workers accounted for $13.2 billion or almost 40 percent of the total. Average hourly earnings for aerospace production workers—again including

lump sum payments—came to $13.32 in 1987, up from $12.88 in 1986. Average weekly earnings amounted to $565.64, up from $550.16. The average work week for production employees was 42.5 hours, down from 42.7.

As is customary, the Pacific region dominated in a geographic breakdown of aerospace employment at yearend 1987. Pacific area companies employed 40.3 percent of the total work force. Next, in order, were New England (14.8 percent); Middle Atlantic (10.2 percent); South Atlantic (8.2 percent); West North Central (7.3 percent); Mountain (6.9 percent); South Central (6.8 percent); and East North Central (5.5 percent). In comparison with the previous year's relative rankings, New England supplanted Middle Atlantic as No. 2 and South Atlantic moved ahead of West North Central into fourth place.

The Pacific region also led in all categories in a breakdown by product group. Pacific companies employed 62.2 percent of all workers engaged in civil aircraft manufacture. New England was second with 14.9 percent and West North Central third with 10.2 percent.

Employment in production of military aircraft was more evenly spread: Pacific 23.5 percent, New England 16.8 percent, South Central 13.3 percent, West North Central 12.4 percent, East North Central 11.9 percent and Middle Atlantic 11.7 percent.

In missile production, Pacific area employment amounted to 43.4 percent, New England 22.4 percent and South Atlantic 12.3 percent. The same three areas led in space equipment fabrication, Pacific with 59.4 percent, New England 18.6 percent and South Atlantic 12 percent. □

## ANNUAL AVERAGE EMPLOYMENT IN ALL MANUFACTURING, DURABLE GOODS AND AEROSPACE INDUSTRIES

Calendar Years 1977-1987
(Thousands of Employees)

| Year | All Manufacturing Industries | Durable Goods Industries | Aerospace Industry[a] | | |
|---|---|---|---|---|---|
| | | | TOTAL | As Percent of | |
| | | | | All Manufacturing | Durable Goods |
| 1977 | 19,682 | 11,597 | 820 | 4.2% | 7.1% |
| 1978 | 20,505 | 12,274 | 901 | 4.4 | 7.3 |
| 1979 | 21,040 | 12,760 | 1,034 | 4.9 | 8.1 |
| 1980 | 20,285 | 12,187 | 1,108 | 5.5 | 9.1 |
| 1981 | 20,170 | 12,109 | 1,115 | 5.5 | 9.2 |
| 1982 | 18,781 | 11,039 | 1,063 | 5.6 | 9.6 |
| 1983 | 18,434 | 10,732 | 1,043 | 5.6 | 9.7 |
| 1984 | 19,378 | 11,505 | 1,084 | 5.6 | 9.4 |
| 1985 | 19,260 | 11,490 | 1,180 | 6.1 | 10.3 |
| 1986r | 18,994 | 11,244 | 1,251 | 6.6 | 11.1 |
| 1987 | 19,112 | 11,237 | 1,309 | 6.8 | 11.6 |

Source: Manufacturing and Durable Goods Employment from Bureau of Labor Statistics, "Employment and Earnings" (Monthly). Aerospace Employment from Aerospace Industries Association estimates based on "Employment and Earnings," Bureau of Labor Statistics.

NOTE: For explanation of "Aerospace Employment," see the Glossary.

a AIA employment data for 1977-1986 were substantially revised in 1987 to better account for aerospace industry related employment.

r Revised.

## ANNUAL PAYROLL
## AEROSPACE INDUSTRY AND ALL MANUFACTURING INDUSTRIES[d]

Calendar Years 1977-1987
(Millions of Dollars)

| Year | All Manufacturing Industries[b] | Aerospace[a] | | | Aerospace As Percent of All Manufacturing |
|---|---|---|---|---|---|
| | | TOTAL | Production Workers | Other | |
| 1977 | 266,000 | $11,127 | $ 4,445 | $ 6,682 | 4.2% |
| 1978 | 299,200 | 13,356 | 5,442 | 7,914 | 4.5 |
| 1979 | 333,900 | 16,830 | 7,184 | 9,646 | 5.0 |
| 1980 | 354,600 | 19,969 | 8,509 | 11,460 | 5.6 |
| 1981 | 385,300 | 22,113 | 9,046 | 13,067 | 5.7 |
| 1982 | 382,900 | 23,071 | 8,938 | 14,133 | 6.0 |
| 1983 | 397,400 | 23,243 | 8,948 | 14,295 | 5.8 |
| 1984r | 439,100 | 26,114 | 9,694 | 16,420 | 5.9 |
| 1985r | 460,900 | 30,370 | 10,807 | 19,563 | 6.6 |
| 1986r | 470,500r | 32,087 | 11,991 | 20,096 | 6.8 |
| 1987 | 484,000 | 33,817 | 12,905 | 20,912 | 7.0 |

### AEROSPACE—INCLUDING LUMP-SUM PAYMENTS[c]

| Year | TOTAL | Production Workers | Other | Aerospace As Percent of All Manufacturing |
|---|---|---|---|---|
| 1984r | $26,171 | $ 9,751 | $16,420 | 6.0% |
| 1985r | 30,451 | 10,888 | 19,563 | 6.6 |
| 1986r | 32,197 | 12,101 | 20,096 | 6.8 |
| 1987 | 34,030 | 13,118 | 20,912 | 7.0 |

Source: Manufacturing Payroll from Bureau of Economic Analysis, "Survey of Current Business." Aerospace Payroll from Aerospace Industries Association estimates.

*a* Based on AIA estimates of annual average employment and earnings for the aerospace industry, derived from BLS data (see Glossary, "Aerospace Employment" and "Aerospace Payroll").

*b* See Glossary, "Payroll, All Manufacturing."

*c* Many aerospace manufacturers have included lump-sum payments in labor settlements since late 1983 in lieu of general wage increases and or cost of living adjustments. These payments are included in a separate wage series for SIC 3721 (Airframes) by the Bureau of Labor Statistics and are included in the totals for production workers and all aerospace by AIA.

*d* Aerospace employment data covering the period 1977 to 1986 were revised in 1987. As a result, aerospace payroll data over the period have been adjusted to reflect the revised employment figures.

*r* Revised.

## EMPLOYMENT IN THE AEROSPACE INDUSTRY[a]

Calendar Years 1977-1987
(Annual Average, Thousands of Employees)

| Year | TOTAL | Aircraft, Engines, & Parts (SIC 372) | Missiles & Space Vehicles (SIC 376) | Other |
|---|---|---|---|---|
| **TOTAL EMPLOYMENT** | | | | |
| 1977 | 820 | 482 | 83 | 255 |
| 1978 | 901 | 527 | 93 | 280 |
| 1979 | 1,034 | 611 | 102 | 321 |
| 1980 | 1,108 | 652 | 111 | 345 |
| 1981 | 1,115 | 646 | 123 | 347 |
| 1982 | 1,063 | 601 | 131 | 330 |
| 1983 | 1,043 | 578 | 141 | 324 |
| 1984 | 1,084 | 593 | 154 | 337 |
| 1985 | 1,180 | 636 | 177 | 367 |
| 1986[r] | 1,251 | 673 | 190 | 389 |
| 1987 | 1,309 | 692 | 210 | 407 |
| **PRODUCTION WORKERS** | | | | |
| 1977 | 295 | 247 | 26 | 22 |
| 1978 | 329 | 275 | 29 | 25 |
| 1979 | 394 | 332 | 33 | 29 |
| 1980 | 421 | 355 | 35 | 31 |
| 1981 | 410 | 343 | 37 | 31 |
| 1982 | 373 | 305 | 40 | 28 |
| 1983 | 354 | 283 | 46 | 26 |
| 1984 | 363 | 285 | 52 | 27 |
| 1985 | 393 | 303 | 61 | 29 |
| 1986 | 423 | 328 | 64 | 32 |
| 1987 | 446 | 344 | 68 | 33 |

Source: Aerospace Industries Association, derived from "Employment and Earnings" (Monthly), Bureau of Labor Statistics.
NOTE: AIA employment data for 1977-1986 were substantially revised in 1987 to better account for aerospace industry related employment.

*a* See Glossary for detailed explanation of "Aerospace Employment."
*b* Communications, navigation, flight control, and displays (aerospace related portions of SICs 3662, 381, & 382).
*r* Revised.

## EMPLOYMENT IN THE AIRCRAFT, ENGINES, AND PARTS INDUSTRY[a]

Calendar Years 1977-1987
(Annual Average, Thousands of Employees)

| Year | TOTAL (SIC 372) | Airframes (SIC 3721) | Engines and Parts (SIC 3724) | Other Parts & Equipment (SIC 3728) |
|---|---|---|---|---|
| TOTAL EMPLOYMENT | | | | |
| 1977 | 481.7 | 270.4 | 120.9 | 90.4 |
| 1978 | 527.2 | 288.3 | 133.5 | 105.5 |
| 1979 | 610.8 | 333.2 | 151.6 | 126.1 |
| 1980 | 652.3 | 349.3 | 162.9 | 140.1 |
| 1981 | 645.5 | 344.2 | 162.5 | 138.8 |
| 1982 | 601.1 | 319.9 | 148.8 | 132.3 |
| 1983 | 578.3 | 304.7 | 140.1 | 133.6 |
| 1984 | 592.7 | 306.1 | 140.2 | 146.4 |
| 1985 | 635.8 | 325.6 | 147.5 | 162.7 |
| 1986 | 674.8 | 339.0 | 153.1 | 182.8 |
| 1987 | 692.1 | 357.1 | 155.7 | 179.2 |
| PRODUCTION WORKERS | | | | |
| 1977 | 246.8 | 124.4 | 66.6 | 55.8 |
| 1978 | 275.4 | 133.9 | 75.3 | 66.2 |
| 1979 | 332.1 | 165.9 | 86.4 | 79.8 |
| 1980 | 354.6 | 173.7 | 93.0 | 88.0 |
| 1981 | 343.0 | 167.0 | 92.4 | 83.6 |
| 1982 | 305.4 | 144.7 | 84.2 | 76.6 |
| 1983 | 282.5 | 131.5 | 74.7 | 76.3 |
| 1984 | 284.6 | 128.2 | 73.0 | 83.5 |
| 1985 | 303.8 | 135.5 | 74.8 | 93.6 |
| 1986 | 330.9 | 146.6 | 78.4 | 105.9 |
| 1987 | 344.1 | 159.6 | 79.1 | 105.3 |

Source: Bureau of Labor Statistics, "Employment and Earnings" (Monthly).
NOTE: Detail may not add to totals because of rounding.
a: See Glossary for detailed explanation of "Aerospace Employment."

## AEROSPACE INDUSTRY EMPLOYMENT BY OCCUPATIONAL CLASSIFICATION

As of December 1977-1988
(Thousands of Employees)

| Year | TOTAL[a] | Production Workers | Scientists & Engineers | Technicians | Others |
|---|---|---|---|---|---|
| 1977[b] | 665 | 280 | 139 | 46 | 200 |
| 1978 | 720 | 337 | 130 | 50 | 203 |
| 1979 | 842 | 396 | 146 | 56 | 244 |
| 1980 | 902 | 414 | 158 | 62 | 268 |
| 1981 | 900 | 399 | 156 | 69 | 276 |
| 1982 | 831 | 367 | 151 | 59 | 254 |
| 1983[b] | 830 | 351 | 156 | 66 | 257 |
| 1984 | 850 | 364 | 160 | 67 | 259 |
| 1985 | 939 | 392 | 175 | 67 | 305 |
| 1986 | 967 | 446 | 178 | 66 | 277 |
| 1987[p] | 972 | 440 | 183 | 68 | 281 |
| 1988[E] | 971 | 434 | 187 | 69 | 281 |

Source: Aerospace Industries Association, based on company reports and data from the Bureau of Labor Statistics.
NOTE: AIA employment data for 1977-1987 were substantially revised in 1987 to better account for aerospace industry related employment and are not comparable to previously published figures. Totals for employment by occupational classification reflect only companies in sics 372, 376, 3662, 381 and 382. As a result, they do no match the totals for aerospace employment by product group which include other industries with employment related to aerospace.

a. End-of-year totals differ from annual averages appearing in other tables.
b. Industry strike during this period.
E. Estimate.
p. Preliminary.

# GEOGRAPHIC DISTRIBUTION OF AEROSPACE EMPLOYMENT[a] BY OCCUPATIONAL CLASSIFICATION AND PRODUCT GROUP

As of December 1987

PERCENT DISTRIBUTION BY OCCUPATION

| Region | TOTAL | Production Workers | Scientists & Engineers | Technicians | All Others |
|---|---|---|---|---|---|
| TOTAL | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |
| New England | 14.8% | 19.2% | 10.1% | 10.9% | 14.1% |
| Middle Atlantic | 10.2 | 8.5 | 14.0 | 7.2 | 10.3 |
| East North Central | 5.5 | 7.0 | 4.1 | 4.4 | 5.1 |
| West North Central | 7.3 | 9.0 | 6.8 | 5.9 | 6.3 |
| South Atlantic | 8.2 | 7.6 | 7.3 | 6.9 | 9.5 |
| South Central | 6.8 | 7.7 | 5.9 | 4.5 | 6.9 |
| Mountain | 6.9 | 5.9 | 8.1 | 8.0 | 6.9 |
| Pacific | 40.3 | 35.1 | 43.7 | 52.2 | 40.9 |

PERCENT DISTRIBUTION BY PRODUCT GROUP

| Region | Total | Aircraft | | Missiles | Space | Other | |
|---|---|---|---|---|---|---|---|
| | | Civil | Military | | | Aero | Non-Aero |
| TOTAL | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100% |
| New England | 14.6% | 14.9% | 16.8% | 22.4% | 18.6% | 13.3% | 9.1% |
| Middle Atlantic | 9.9 | 1.9 | 11.7 | 0.3 | | 18.9 | |
| East North Central | 5.4 | 10.2 | 11.9 | 0.2 | 0.6 | 3.1 | 12.7 |
| West North Central | 8.0 | | 12.4 | 3.7 | | 6.7 | |
| South Atlantic | 8.8 | 2.2 | 8.1 | 12.3 | 12.0 | 10.7 | 10.1 |
| South Central | 7.1 | 4.9 | 13.3 | 0.9 | 2.6 | 5.0 | 6.2 |
| Mountain | 6.7 | 3.7 | 2.3 | 16.8 | 6.8 | 42.3 | 1.5 |
| Pacific | 39.5 | 62.2 | 23.5 | 43.4 | 59.4 | | 60.4 |

Source: Aerospace Industries Association, company reports.

NOTE: Data for two regions are combined where employment for one region within a product group represented three or fewer companies.

a Employment in 40 surveyed aerospace manufacturing companies representing approximately two-thirds of total industry employment.

## TOTAL EMPLOYMENT AND SCIENTISTS & ENGINEERS IN COMMERCIAL TRANSPORT AIRCRAFT & HELICOPTER MANUFACTURING ESTABLISHMENTS[b]

As of December 1977-1988

| Year | Commercial Transport Aircraft | | Helicopters | |
|---|---|---|---|---|
| | Total | Scientists & Engineers | Total | Scientists & Engineers |
| 1977[a] | 55,900 | 8,100 | 21,100 | 3,500 |
| 1978 | 58,700 | 8,700 | 24,200 | 3,300 |
| 1979 | 99,800 | 12,900 | 27,500 | 3,000 |
| 1980 | 106,500 | 13,700 | 29,800 | 3,200 |
| 1981 | 84,000 | 12,000 | 28,000 | 3,000 |
| 1982 | 69,800 | 11,100 | 26,600 | 3,100 |
| 1983[a] | 48,200 | 8,400 | 27,600 | 3,500 |
| 1984 | 57,600 | 9,300 | 31,300 | 3,800 |
| 1985 | 58,700 | 10,000 | 34,200 | 4,300 |
| 1986 | 79,100 | 12,900 | 37,300 | 4,000 |
| 1987[p] | 86,200 | 13,700 | 38,300 | 4,300 |
| 1988[E] | 88,100 | 14,000 | 37,500 | 4,100 |

Source: Aerospace Industries Association, company reports.

NOTE: AIA employment data for 1977-1987 were subsequently revised in 1987 to better correspond to aerospace industry related employment.

*E* Estimate.

*a* Industry strike during this period.

*b* Includes only establishments classified as prime manufacturers of commercial transport aircraft and of civil and military helicopters. Excludes subcontractors and engine manufacturers.

*p* Preliminary.

# AVERAGE HOURLY EARNINGS IN THE AEROSPACE INDUSTRY

Production Workers Only
Calendar Years 1973-1987

| Year | TOTAL[a] | Aircraft (SIC 372) | | | | Guided Missiles, Space Vehicles & Parts (SIC 376) |
|---|---|---|---|---|---|---|
| | | TOTAL | Airframes (SIC 3721) | Engines & Parts (SIC 3724) | Other Parts & Equipment (SIC 3728) | |
| **AVERAGE HOURLY EARNINGS[b]** | | | | | | |
| 1973 | $ 4.99 | $ 4.99 | $ 5.09 | $ 5.04 | $ 4.70 | $ 5.02 |
| 1974 | 5.43 | 5.42 | 5.53 | 5.41 | 5.05 | 5.48 |
| 1975 | 6.00 | 6.00 | 6.21 | 6.04 | 5.47 | 6.02 |
| 1976 | 6.44 | 6.44 | 6.63 | 6.46 | 5.95 | 6.48 |
| 1977 | 6.93 | 6.92 | 7.07 | 7.05 | 6.44 | 7.04 |
| 1978 | 7.54 | 7.54 | 7.70 | 7.80 | 6.93 | 7.56 |
| 1979 | 8.26 | 8.26 | 8.50 | 8.53 | 7.48 | 8.25 |
| 1980 | 9.27 | 9.28 | 9.66 | 9.42 | 8.40 | 9.22 |
| 1981 | 10.29 | 10.31 | 10.74 | 10.41 | 9.35 | 10.06 |
| 1982 | 11.20 | 11.23 | 11.85 | 11.16 | 10.18 | 10.96 |
| 1983 | 11.79 | 11.82 | 12.58 | 11.61 | 10.73 | 11.61 |
| 1984 | 12.24 | 12.32 | 12.91 | 12.40 | 11.37 | 11.82 |
| 1985 | 12.54 | 12.62 | 13.18 | 12.85 | 11.63 | 12.14 |
| 1986 | 12.76 | 12.87 | 13.48 | 13.08 | 11.91 | 12.20 |
| 1987 | 13.09 | 13.19 | 13.74 | 13.33 | 12.26 | 12.60 |
| **AVERAGE HOURLY EARNINGS INCLUDING LUMP-SUM WAGE PAYMENTS** | | | | | | |
| 1984 | $12.58 | $12.72 | $13.11 | $12.40 | $11.37 | $ 11.88 |
| 1985 | 12.93 | 13.10 | 13.40 | 12.85 | 11.63 | 12.06 |
| 1986 | 12.88 | 13.02 | 13.80 | 13.08 | 11.91 | 12.15 |
| 1987 | 13.32 | 13.46 | 14.32 | 13.33 | 12.26 | 12.60 |

Source: Aerospace Industries Association, derived from "Employment and Earnings" (Monthly), Bureau of Labor Statistics.

*a* TOTAL column is a weighted average based on BLS employment data.

*b* Includes overtime premiums.

*c* Many aerospace manufacturers have included lump-sum payments in labor settlements since late 1983 in lieu of general wage increases and/or cost of living adjustments. These payments are included in SIC 3721 as well as the totals for SIC 372 and for all aerospace.

*r* Revised.

## AVERAGE WEEKLY EARNINGS IN THE AEROSPACE INDUSTRY

Production Workers Only
Calendar Years 1973-1987

| Year | TOTAL[a] | Aircraft (SIC 372) | | | | Guided Missiles, Space Vehicles & Parts (SIC 376) |
|---|---|---|---|---|---|---|
| | | TOTAL | Airframes (SIC 3721) | Engines & Parts (SIC 3724) | Other Parts & Equipment (SIC 3728) | |
| **AVERAGE WEEKLY EARNINGS[b]** | | | | | | |
| 1973 | $202.95 | $202.10 | $199.53 | $209.66 | $199.75 | $211.34 |
| 1974 | 221.10 | 220.59 | 222.08 | 221.81 | 213.62 | 226.32 |
| 1975 | 247.53 | 247.80 | 255.85 | 247.04 | 228.65 | 245.01 |
| 1976 | 263.31 | 263.40 | 273.16 | 259.69 | 245.74 | 262.44 |
| 1977 | 289.76 | 289.95 | 296.23 | 291.87 | 273.70 | 287.94 |
| 1978 | 318.05 | 318.19 | 324.17 | 325.26 | 298.68 | 316.76 |
| 1979 | 350.64 | 351.05 | 359.55 | 360.82 | 322.39 | 346.50 |
| 1980 | 388.71 | 389.76 | 403.79 | 393.76 | 357.84 | 378.02 |
| 1981 | 424.31 | 425.80 | 443.56 | 421.61 | 396.44 | 410.45 |
| 1982 | 459.99 | 461.55 | 484.67 | 454.21 | 426.54 | 448.26 |
| 1983 | 486.10 | 486.98 | 526.73 | 476.01 | 452.81 | 480.65 |
| 1984[r] | 513.55 | 516.21 | 531.89 | 523.28 | 485.50 | 496.44 |
| 1985[r] | 528.82 | 532.56 | 546.97 | 542.27 | 504.74 | 517.44 |
| 1986[r] | 545.13 | 550.84 | 567.51 | 561.13 | 520.47 | 517.28 |
| 1987 | 556.42 | 560.58 | 579.83 | 566.53 | 525.95 | 535.50 |
| **AVERAGE WEEKLY EARNINGS INCLUDING LUMP-SUM PAYMENTS[c]** | | | | | | |
| 1984[r] | $516.19 | $519.79 | $540.13 | $523.28 | $485.50 | $496.44 |
| 1985[r] | 533.63 | 536.68 | 556.10 | 542.27 | 504.74 | 517.74 |
| 1986[r] | 550.16 | 556.91 | 580.98 | 561.13 | 520.47 | 517.28 |
| 1987 | 565.64 | 571.63 | 604.30 | 566.53 | 525.95 | 535.50 |

Source: Aerospace Industries Association, derived from Employment and Earnings (Monthly), Bureau of Labor Statistics

a. TOTAL column is a weighted average based on BLS employment data.

b. Includes overtime premiums.

c. Many aerospace manufacturers have negotiated lump-sum payments in lieu of wage settlements since late 1982 in lieu of general wage increases and in view of cost-of-living escalation. These payments are included in SIC 3721 as well as the totals for SIC 372 and for all industries.

r. Revised.

# AVERAGE HOURS IN THE AEROSPACE INDUSTRY

Production Workers Only
Calendar Years 1973-1987

## AVERAGE WEEKLY HOURS

| Year | TOTAL[a] | Aircraft (SIC 372) | | | | Guided Missiles, Space Vehicles & Parts (SIC 376) |
|---|---|---|---|---|---|---|
| | | TOTAL | Airframes (SIC 3721) | Engines & Parts (SIC 3724) | Other Parts & Equipment (SIC 3728) | |
| 1973 | 40.6 | 40.5 | 39.2 | 41.6 | 42.5 | 42.1 |
| 1974 | 40.8 | 40.7 | 39.8 | 41.0 | 42.3 | 41.3 |
| 1975 | 41.2 | 41.3 | 41.2 | 40.9 | 41.8 | 40.7 |
| 1976 | 40.9 | 40.9 | 41.2 | 40.2 | 41.3 | 40.5 |
| 1977 | 41.8 | 41.9 | 41.9 | 41.4 | 42.5 | 40.9 |
| 1978 | 42.2 | 42.2 | 42.1 | 41.7 | 43.1 | 41.9 |
| 1979 | 42.5 | 42.5 | 42.2 | 42.3 | 43.1 | 42.0 |
| 1980 | 41.9 | 42.0 | 41.8 | 41.8 | 42.6 | 41.0 |
| 1981 | 41.3 | 41.3 | 41.3 | 40.5 | 42.4 | 40.8 |
| 1982 | 41.1 | 41.1 | 40.9 | 40.7 | 41.9 | 40.8 |
| 1983 | 41.2 | 41.2 | 40.8 | 41.8 | 42.2 | 41.4 |
| 1984 | 41.9 | 41.9 | 41.2 | 42.2 | 42.7 | 42.0 |
| 1985 | 42.2 | 42.2 | 41.5 | 42.2 | 43.4 | 42.3 |
| 1986 | 42.7 | 42.8 | 42.1 | 42.9 | 43.7 | 42.4 |
| 1987 | 42.5 | 42.5 | 42.2 | 42.5 | 42.9 | 42.4 |

## AVERAGE WEEKLY OVERTIME HOURS

| Year | TOTAL | Aircraft, Engines, and Parts | Guided Missiles, Space Vehicles, and Parts |
|---|---|---|---|
| 1973 | 3.2 | 3.3 | 2.7 |
| 1974 | 3.3 | 3.3 | 3.0 |
| 1975 | 3.0 | 3.0 | 3.3 |
| 1976 | 2.7 | 2.7 | 2.7 |
| 1977 | 3.5 | 3.5 | 3.2 |
| 1978 | 4.4 | 4.4 | 4.1 |
| 1979 | 4.7 | 4.7 | 4.4 |
| 1980 | 4.1 | 4.2 | 3.6 |
| 1981 | 3.5 | 3.5 | 3.2 |
| 1982 | 3.2 | 3.2 | 3.1 |
| 1983 | 3.1 | 3.1 | 3.3 |
| 1984 | 3.9 | 4.0 | 3.3 |
| 1985 | 4.5 | 4.5 | 4.6 |
| 1986 | 4.8 | 4.9 | 4.4 |
| 1987 | 4.8 | 4.9 | 4.2 |

Source: Aerospace Industries Association, derived from "Employment and Earnings" (Monthly), Bureau of Labor Statistics.
a TOTAL column is a weighted average based on BLS employment data.

## OCCUPATIONAL INJURY AND ILLNESS INCIDENCE RATES[a] ALL MANUFACTURING AND AEROSPACE INDUSTRIES

Calendar Years 1982-1986

| | 1982 | 1983 | 1984 | 1985 | 1986 |
|---|---|---|---|---|---|
| All Manufacturing: | | | | | |
| Total Cases | 10.2 | 9.7 | 10.6 | 10.4 | 10.6 |
| Lost Workday Cases | 4.4 | 4.7 | 4.7 | 4.6 | 4.7 |
| Nonfatal Cases without Lost Workdays | 5.8 | 5.5 | 5.9 | 5.8 | 5.9 |
| Lost Workdays | 75.0 | 70.4 | 77.9 | 80.2 | 85.2 |
| Aircraft and Parts (SIC 372): | | | | | |
| Total Cases | 6.0 | 5.0 | 5.8 | 6.4 | 7.0 |
| Lost Workday Cases | 2.3 | 1.9 | 2.2 | 2.5 | 2.6 |
| Nonfatal Cases without Lost Workdays | 3.6 | 3.0 | 3.6 | 3.9 | 4.4 |
| Lost Workdays | 36.9 | 33.0 | 35.3 | 43.1 | 43.8 |
| Aircraft (SIC 3721): | | | | | |
| Total Cases | 4.8 | 3.8 | 4.5 | 5.4 | 6.6 |
| Lost Workday Cases | 1.7 | 1.4 | 1.6 | 2.0 | 2.1 |
| Nonfatal Cases without Lost Workdays | 3.1 | 2.4 | 2.9 | 3.5 | 4.5 |
| Lost Workdays | 29.5 | 24.6 | 28.3 | 35.8 | 38.3 |
| Aircraft Engines and Parts (SIC 3724): | | | | | |
| Total Cases | 6.6 | 4.6 | 5.3 | 5.2 | 5.4 |
| Lost Workday Cases | 3.3 | 2.5 | 2.8 | 2.7 | 2.8 |
| Nonfatal Cases without Lost Workdays | 3.3 | 2.1 | 2.5 | 2.5 | 2.6 |
| Lost Workdays | 51.5 | 45.6 | 45.9 | 52.0 | 48.0 |
| Aircraft Parts (SIC 3728): | | | | | |
| Total Cases | 8.1 | 8.0 | 8.9 | 9.4 | 9.0 |
| Lost Workday Cases | 2.8 | 2.6 | 2.9 | 3.4 | 3.3 |
| Nonfatal Cases without Lost Workdays | 5.3 | 5.4 | 6.1 | 6.0 | 5.7 |
| Lost Workdays | 39.1 | 39.0 | 40.0 | 50.1 | 50.1 |
| Guided Missiles, Space Vehicles & Parts (SIC 376): | | | | | |
| Total Cases | 2.7 | 2.3 | 2.7 | 2.8 | 3.1 |
| Lost Workday Cases | 1.2 | 1.1 | 1.2 | 1.2 | 1.5 |
| Nonfatal Cases without Lost Workdays | 1.5 | 1.2 | 1.5 | 1.5 | 1.6 |
| Lost Workdays | 19.1 | 19.4 | 21.0 | 23.1 | 28.3 |
| Guided Missiles & Space Vehicles (SIC 3761): | | | | | |
| Total Cases | 2.1 | 2.1 | 2.5 | 2.5 | 2.8 |
| Lost Workday Cases | 0.9 | 1.1 | 1.1 | 1.2 | 1.4 |
| Nonfatal Cases without Lost Workdays | 1.2 | 1.0 | 1.3 | 1.3 | 1.4 |
| Lost Workdays | 16.3 | 19.4 | 20.0 | 23.0 | 29.5 |
| Space Propulsion Units & Parts (SIC 3764): | | | | | |
| Total Cases | 3.9 | 2.8 | 3.3 | 4.1 | 4.8 |
| Lost Workday Cases | 1.9 | 1.3 | 1.5 | 1.7 | 1.7 |
| Nonfatal Cases without Lost Workdays | 1.9 | 1.5 | 1.8 | 2.4 | 3.1 |
| Lost Workdays | 28.7 | 19.5 | 25.0 | 27.8 | 29.2 |
| Other Space Vehicle Equipment (SIC 3769): | | | | | |
| Total Cases | 5.4 | 3.1 | 3.2 | 3.1 | 3.1 |
| Lost Workday Cases | 1.6 | 1.0 | 0.9 | 1.1 | 1.3 |
| Nonfatal Cases without Lost Workdays | 3.8 | 2.0 | 2.3 | 2.0 | 1.8 |
| Lost Workdays | 26.7 | 19.7 | 22.1 | 20.6 | 21.0 |

Source: Department of Labor, Bureau of Labor Statistics, "Occupational Injuries and Illnesses" (Annually)

a Defined as the number of injuries and illnesses per 100 full-time workers. Separate incidence rates also available for occupational injuries only.

## FEDERAL CIVILIAN EMPLOYMENT[a] IN THE DEPARTMENT OF DEFENSE

Fiscal Years 1965-1989

| Year | TOTAL | Civil Functions[b] | Military Functions[c] |
|---|---|---|---|
| 1965 | 1,004,570 | 29,902 | 974,668 |
| 1966 | 1,083,288 | 30,290 | 1,052,998 |
| 1967 | 1,225,637 | 31,980 | 1,193,657 |
| 1968 | 1,288,130 | 32,062 | 1,256,068 |
| 1969 | 1,257,091 | 31,214 | 1,225,877 |
| 1970 | 1,159,935 | 30,293 | 1,129,642 |
| 1971 | 1,092,804 | 30,063 | 1,062,741 |
| 1972 | 1,040,147 | 30,585 | 1,009,562 |
| 1973 | 987,281 | 29,971 | 957,310 |
| 1974 | 1,002,850 | 29,072 | 973,778 |
| 1975 | 983,790 | 29,069 | 954,721 |
| 1976 | 951,034 | 28,648 | 922,386 |
| 1977 | 940,549 | 28,912 | 911,637 |
| 1978 | 933,071 | 28,962 | 904,109 |
| 1979 | 914,582 | 28,592 | 885,990 |
| 1980 | 907,700 | 27,700 | 880,000 |
| 1981 | 981,400 | 34,400 | 947,000 |
| 1982 | 1,009,344 | 31,263 | 978,081 |
| 1983 | 1,015,779 | 30,973 | 984,806 |
| 1984 | 1,040,213 | 28,681 | 1,011,532 |
| 1985 | 1,065,551 | 28,681 | 1,036,870 |
| 1986 | 1,069,863 | 28,511 | 1,041,352 |
| 1987 | 1,059,516 | 28,199 | 1,031,317 |
| 1988[E] | 1,057,036 | 28,227 | 1,028,809 |
| 1989[E] | 1,045,627 | 28,615 | 1,017,012 |

Source: The Budget of the United States Government, Appendix.

a. Full-time equivalent civilian employment.

b. Data are estimated for portions of Fys 1965-1968.

c. Section 904 of the 1982 Defense Authorization Act (P.L. 97-86) requires the Department of Defense from full-time equivalent (direct, FMS, Allied and host nation) employment for military functions and military assistance.

E. Estimate.

## EMPLOYMENT IN NATIONAL AERONAUTICS AND SPACE ADMINISTRATION PROGRAMS

End of Fiscal Years 1960-1989

| Year | TOTAL | NASA Employees | Contractor Employees[a] |
|---|---|---|---|
| 1960 | 46,768 | 10,268 | 36,500 |
| 1961 | 74,577 | 17,077 | 57,500 |
| 1962 | 137,656 | 22,156 | 115,500 |
| 1963 | 246,304 | 27,904 | 218,400 |
| 1964 | 379,084 | 31,984 | 347,100 |
| 1965 | 409,900 | 33,200 | 376,700 |
| 1966 | 393,924 | 33,924 | 360,000 |
| 1967 | 306,926 | 33,726 | 273,200 |
| 1968 | 267,871 | 32,471 | 235,400 |
| 1969 | 218,345 | 31,745 | 186,600 |
| 1970 | 160,850 | 31,350 | 129,500 |
| 1971 | 143,578 | 29,478 | 114,100 |
| 1972 | 138,800 | 27,500 | 111,300 |
| 1973 | 134,850 | 26,850 | 108,000 |
| 1974 | 125,220 | 25,020 | 100,200 |
| 1975 | 127,733 | 24,333 | 103,400 |
| 1976 | 130,739 | 24,039 | 108,000 |
| 1977 | 124,136 | 23,636 | 100,500 |
| 1978 | 124,637 | 23,237 | 101,400 |
| 1979 | 131,931 | 22,831 | 109,100 |
| 1980 | 135,613 | 22,613 | 113,000 |
| 1981 | 133,473 | 21,873 | 111,600 |
| 1982 | 127,952 | 21,652 | 106,300 |
| 1983 | 129,246 | 22,246 | 107,000 |
| 1984 | 162,080 | 22,080 | 140,000 |
| 1985 | 131,993 | 21,993 | 110,000 |
| 1986 | 154,800 | 21,800 | 133,000 |
| 1987 | 165,312 | 22,312 | 143,000 |
| 1988[E] | 172,425 | 22,425 | 150,000 |
| 1989[E] | 212,950 | 22,950 | 190,000 |

Source: NASA Briefing on the Budget of the United States (Annually) and NASA Headquarters.

a Includes estimates of manpower for hardware and related contracts, as well as actual work-years for support service contracts. Increase in FY 1984 caused by change in estimating methodology to reflect more accurately the mix of support and development contractors.

E Estimate.

## AEROSPACE INDUSTRY WORK STOPPAGES[a]

Calendar Years 1978-1987

| Year[b] | Number of Strikes[c] | Number of Workers Involved | Work-Days Idle in Year |
|---|---|---|---|
| 1978 | 17 | 13,700 | 741,200 |
| 1979 | 12 | 6,600 | 103,400 |
| 1980 | 17 | 4,400 | 92,900 |
| 1981 | 12 | 6,100 | 188,900 |
| 1982 | 4 | 11,900 | 45,200 |
| 1983 | 2 | 8,700 | 404,100 |
| 1984 | 4 | 14,600 | 188,200 |
| 1985 | 4 | 19,700 | 289,800 |
| 1986 | — | — | — |
| 1987 | — | — | — |

Source: Department of Labor, Bureau of Labor Statistics, Division of Wages and Industry Relations.

a Based on SIC 372 of the 1967 Code, which includes missile and space propulsion units and parts and missile and space vehicle equipment not elsewhere classified, but excludes ordnance complete guided missiles and space vehicles.

b Effective 1982, data not available for work stoppages involving fewer than 1,000 employees.

c Strikes beginning during calendar year.

## EMPLOYMENT AND COST OF R&D SCIENTISTS AND ENGINEERS ALL INDUSTRIES AND AEROSPACE INDUSTRY

1973-1987

| Year | Employment[a] | | | Cost per R&D Scientist and Engineer[d] | |
|---|---|---|---|---|---|
| | All Industries[b] (Thousands) | Aerospace[c] (Thousands) | Aerospace as a Percent of All Industries | All Industries[b] | Aerospace[c] |
| 1973 | 357.7 | 72.1 | 20.2 | $ 59,200 | $ 70,800 |
| 1974 | 360.0 | 70.6 | 19.6 | 63,300 | 76,400 |
| 1975 | 363.3 | 67.5 | 18.6 | 66,500 | 85,100 |
| 1976 | 364.4 | 66.9 | 18.4 | 72,200 | 91,300 |
| 1977 | 382.8 | 72.0 | 18.8 | 75,800 | 91,300 |
| 1978 | 404.4 | 82.0 | 20.3 | 80,400 | 89,400 |
| 1979 | 423.9 | 86.5 | 20.4 | 87,400 | 93,300 |
| 1980 | 450.6 | 85.9 | 19.1 | 94,900 | 101,600 |
| 1981 | 487.8 | 95.2 | 19.5 | 103,900 | 128,400 |
| 1982 | 509.8 | 91.1 | 17.9 | 112,400 | 146,400 |
| 1983 | 522.1 | 95.5 | 18.3 | 118,900 | 144,300 |
| 1984 | 544.5 | 96.5 | 17.7 | 129,700 | 158,400 |
| 1985 | 560.2 | 103.8 | 18.5 | 137,800 | 169,800 |
| 1986[r] | 583.6 | 107.2 | 18.4 | 138,100 | 162,000 |
| 1987 | 584.5 | 93.3 | 16.0 | NA | NA |

Source: National Science Foundation.

a Employment as of January. Scientists and engineers working less than full time have been included in terms of their full time equivalent number.

b All manufacturing industries and those non-manufacturing industries known to conduct or finance research and development.

c SIC codes 372 and 376.

d The arithmetic mean of the numbers of R&D scientists and engineers reported for January in two consecutive years, divided into the total R&D expenditures of each industry during the earlier year.

NA Not available.

r Revised.

# Finance

The aerospace industry recorded a record net profit after taxes of $4.6 billion in 1987, reversing a downward trend in evidence for the two prior years. The figure compares with the previous high, experienced in 1984, of $3.6 billion. Comparison with 1986 is not entirely valid because of accounting procedures in that year occasioned by the Tax Reform Act of 1986.

Despite the gain, 1987 aerospace profits were below the averages for all U.S. manufacturing corporations when profit is expressed as a percentage of sales or assets. As a percentage of sales, the aerospace rate was 4.1 percent, the all-industry average 4.9 percent. As a percentage of assets, it was 4.4 percent for aerospace, 5.6 percent for all manufacturing.

The picture is slightly different when profit is expressed as a percentage of equity. Aerospace, at 14.6 percent, topped the all-industry average of 12.8 percent.

The aerospace industry's balance sheet for 1987 showed an increase in total assets to $106.9 billion, up from $102.4 billion in 1986. Net working capital dipped from $9.7 billion in 1986 to $9.5 billion in 1987.

Aerospace expenditures for new plant and equipment amounted to $3.6 billion in 1987, down from $3.8 billion but above the $3.4 billion average for the period 1980-86. Estimated plant and equipment outlays for 1988 are the same as for 1987, $3.6 billion.

In Fiscal Year 1987, McDonnell Douglas Corporation displaced General Dynamics Corporation as leading contractor to the Department of Defense in terms of contract dollar value. McDonnell Douglas won contracts with an aggregate value of $7.7 billion. General Dynamics was second with $7 billion, General Electric Company third with $5.8 billion.

Rounding out the top 10 were Lockheed Corporation, $5.6 billion; General Motors Corporation, $4.1 billion; Raytheon Company, $3.8 billion; Martin Marietta Corporation, $3.7 billion; United Technologies Corporation, $3.6 billion; The Boeing Company, $3.5 billion; and Grumman Corporation, $3.4 billion.

Perennial leader Rockwell International Corporation topped the list of NASA contract

awards in FY 1987 with $1.6 billion. Martin Marietta Corporation and Lockheed Space Operations Company were virtually tied for second at $326 million and $323 million respectively. In fourth and fifth places were Morton Thiokol Inc. ($286 million) and McDonnell Douglas Corporation ($285 million).

The rest of the top 10 included General Electric Company ($225 million); USBI Booster Production Company ($183 million); The Boeing Company ($175 million); United Technologies Corporation ($166 million); and Lockheed Engineering & Management Company ($163 million). □

## NET PROFIT AFTER TAXES

Source: Aerospace Industries Association

# NET PROFIT AFTER TAXES AS A PERCENT OF SALES, ASSETS, AND EQUITY FOR ALL MANUFACTURING CORPORATIONS AND THE AEROSPACE INDUSTRY[a]

Calendar Years 1973-1987

PERCENT OF SALES

| Year | All Manufacturing Corporations | Non-Durable Goods | Durable Goods | Aerospace Industry |
|---|---|---|---|---|
| 1973 | 4.7% | 5.0% | 4.5% | 2.9% |
| 1974 | 5.5 | 6.4 | 4.7 | 2.9 |
| 1975 | 4.6 | 5.1 | 4.1 | 2.9 |
| 1976 | 5.4 | 5.5 | 5.2 | 3.4 |
| 1977 | 5.3 | 5.3 | 5.3 | 4.2 |
| 1978 | 5.4 | 5.4 | 5.5 | 4.4 |
| 1979 | 5.7 | 6.1 | 5.2 | 5.0 |
| 1980 | 4.8 | 5.6 | 4.0 | 4.3 |
| 1981 | 4.7 | 5.1 | 4.3 | 4.4 |
| 1982 | 3.5 | 4.6 | 2.4 | 3.3 |
| 1983 | 4.1 | 4.9 | 3.1 | 3.5 |
| 1984 | 4.7 | 4.8 | 4.4 | 4.1 |
| 1985 | 3.8 | 4.1 | 3.4 | 3.1 |
| 1986[r] | 3.7 | 4.6 | 2.9 | 2.8 |
| 1987 | 4.9 | 5.2 | 4.6 | 4.1 |

PERCENT OF ASSETS[b] AND EQUITY[b]

| Year | Percent of Assets | | Percent of Equity | |
|---|---|---|---|---|
| | All Manufacturing | Aerospace Industry | All Manufacturing | Aerospace Industry |
| 1973 | 6.5% | 2.4% | 12.8% | 10.3% |
| 1974 | 8.0 | 3.7 | 14.9 | 10.4 |
| 1975 | 6.2 | 3.8 | 11.6 | 11.0 |
| 1976 | 7.5 | 4.7 | 14.0 | 12.8 |
| 1977 | 7.6 | 5.7 | 14.2 | 14.9 |
| 1978 | 7.8 | 5.5 | 15.0 | 15.7 |
| 1979 | 8.4 | 6.3 | 16.5 | 18.4 |
| 1980 | 6.3 | 5.2 | 13.9 | 16.0 |
| 1981 | 6.7 | 5.2 | 13.6 | 15.9 |
| 1982 | 4.5 | 3.7 | 9.2 | 12.0 |
| 1983 | 5.2 | 4.1 | 10.6 | 12.2 |
| 1984 | 5.9 | 4.7 | 12.5 | 14.1 |
| 1985 | 4.6 | 3.5 | 10.1 | 11.1 |
| 1986 | 4.2 | 3.0 | 9.5 | 9.4 |
| 1987 | 5.6 | 4.4 | 12.8 | 14.6 |

Source: Bureau of the Census, Quarterly Financial Report for Manufacturing, Mining and Trade Corporations.

a Based on a sample of corporate entities classified in SIC codes 372 and 376, having as their principal activity the manufacture of aircraft, guided missiles, space vehicles, and propulsion and parts.

b Average of four quarters.

r Revised.

## INCOME STATEMENT AND OPERATING RATIOS FOR AEROSPACE COMPANIES[a]

Calendar Years 1984-1987
(Millions of Dollars)

| INCOME STATEMENT | 1984 | 1985 | 1986 | 1987 |
|---|---|---|---|---|
| Net Sales, Receipts, Operating Revenues | $88,728 | $105,853 | $111,580 | $110,902 |
| Less: Depreciation, Depletion & Amortization of Property, Plant and Equipment | 2,502 | 3,083 | 3,411 | 3,636 |
| Less: All Other Operating Costs & Expenses, Including Selling Costs & General & Administrative Expenses | 80,695 | 97,752 | 102,568 | 101,053 |
| **Income (or Loss) from Operations** | $ 5,531 | $ 5,018 | $ 5,600 | $ 6,303 |
| Net Non-Operating Income (Expense) | 37 | 679 | (264) | 499 |
| **Income (or Loss) before Income Taxes ( = Total Income)** | $ 5,567 | $ 5,696 | $ 5,337 | $ 6,801 |
| Less: Provision for Current & Deferred Domestic Income Taxes | 1,928 | 2,422 | 2,243 | 2,219 |
| **Income (or Loss) after Income Taxes ( = Net Profit)** | $ 3,639 | $ 3,274 | $ 3,093 | $ 4,582 |
| Cash Dividends Charged to Retained Earnings | 1,124 | 1,871 | 1,432 | 1,457 |
| **Net Income Retained in Business** | $ 2,516 | $ 1,403 | $ 1,661 | $ 3,125 |
| Retained Earnings at Beginning of Year[b] | 17,705 | 20,558 | 20,475 | 22,128 |
| Adjustments to Retained Earnings[c] | 31 | (1,452) | (414) | (493) |
| **Retained Earnings at End of Year[d]** | $20,252 | $ 20,509 | $ 21,722 | $ 24,882 |
| **OPERATING RATIOS** | | | | |
| Income before Taxes as Percent of Net Sales | 6.3% | 5.4% | 4.8% | 6.1% |
| Provision for Current & Deferred Domestic Income Taxes as Percent of Income before Taxes (Total Income) | 34.6 | 42.5 | 42.0 | 32.6 |
| Income after Taxes (Net Profit) as Percent of Net Sales | 4.1 | 3.1 | 2.8 | 4.1 |
| Income after Taxes (Net Profit) as Percent of Stockholders' Equity[e] | 14.1 | 11.1 | 9.4 | 14.6 |
| Income after Taxes (Net Profit) as Percent of Total Assets[e] | 4.7 | 3.5 | 3.0 | 4.4 |

Source: Bureau of the Census, Quarterly Financial Report for Manufacturing, Mining, and Trade Corporations.
NOTE: Detail may not add to totals because of rounding.

a. Based on sample of corporate entities classified in SIC codes 372 and 376, having as their principal activity the manufacture of aircraft, guided missiles, space vehicles, and propulsion unit parts.
b. Beginning-of-year retained earnings for any particular year do not equal end of year retained earnings for the previous year because of rotation of small companies in survey sample.
c. Other direct credits (or charges) to retained earnings (net), including stock and other non-cash dividends, etc.
d. Retained Earnings at End of Year CALCULATED AS Retained Earnings at Beginning of Year PLUS Income (Loss) after Income Taxes MINUS Cash Dividends Charged to Retained Earnings PLUS Adjustments to Retained Earnings.
e. Average of four quarters.

## BALANCE SHEET FOR AEROSPACE COMPANIES[a]

December 31, 1984-1987
(Millions of Dollars)

| | 1984 | 1985 | 1986 | 1987 |
|---|---|---|---|---|
| **Assets:** | | | | |
| Current Assets | | | | |
| Cash | $ 2,184 | $ 5,300 | $ 4,524 | $ 3,592 |
| Securities, Com'l Paper & Other Short-term Financial Investments | 2,904 | 937 | 2,352 | 2,365 |
| Total Cash and U.S. Gov't and Other Securities | $ 5,089 | $ 6,236 | $ 6,876 | $ 5,956 |
| Receivables (Total) | 10,165 | 12,126 | 13,077 | 15,576 |
| Inventories (Gross) | 37,569 | 38,967 | 41,028 | 44,812 |
| Other Current Assets | 1,266 | 1,623 | 1,582 | 1,612 |
| **Total Current Assets** | $54,088 | $58,952 | $ 62,562 | $ 67,957 |
| Net Plant, Property & Equipment | 15,773 | 19,454 | 22,103 | 22,017 |
| Other Non-Current Assets | 10,235 | 15,161 | 17,748 | 16,882 |
| **Total Assets** | $80,096 | $93,567 | $102,414 | $106,856 |
| **Liabilities:** | | | | |
| Current Liabilities | | | | |
| Short Term Loans | $ 1,680 | $ 2,480 | $ 1,547 | $ 1,551 |
| Trade Accts. & Notes Payable | 6,672 | 8,148 | 8,926 | 9,706 |
| Income Taxes Accrued | 4,378 | 5,033 | 5,723 | 6,393 |
| Installments Due on Long Term Debts | 614 | 518 | 545 | 591 |
| Other Current Liabilities | 31,014 | 33,828 | 36,162 | 40,262 |
| **Total Current Liabilities** | $44,359 | $50,007 | $ 52,903 | $ 58,502 |
| Long Term Debt | 4,818 | 7,844 | 10,915 | 10,855 |
| Other Non-Current Liabilities | 4,302 | 6,020 | 5,701 | 5,807 |
| **Total Liabilities** | $53,478 | $63,871 | $ 69,520 | $ 75,164 |
| **Stockholders' Equity:** | | | | |
| Capital Stock | $ 6,366 | $ 9,188 | $ 11,172 | $ 6,810 |
| Retained Earnings | 20,252 | 20,509 | 21,722 | 24,882 |
| **Total Stockholders' Equity** | $26,618 | $29,696 | $ 32,894 | $ 31,692 |
| **Total Liabilities & Stockholders' Equity** | $80,096 | $93,567 | $102,414 | $106,856 |
| **Net Working Capital** | $ 9,730 | $ 8,945 | $ 9,659 | $ 9,455 |

Source: Bureau of the Census, "Quarterly Financial Report for Manufacturing, Mining and Trade Corporations."
NOTE: Detail may not add to totals because of rounding.
a. Based on sample of corporate entities classified in SIC codes 372 and 376, having as their principal activity the manufacture of aircraft, guided missiles, space vehicles and propulsion unit parts.

## NEW PLANT AND EQUIPMENT EXPENDITURES

Calendar Years 1964-1988
(Billions of Dollars)

| Year | All Industries | All Manufacturing Industries | Durable Goods | Aerospace[a] | |
|---|---|---|---|---|---|
| | | | | Current Dollars | Constant Dollars 1982 = 100[b] |
| 1964 | $ 51.26 | $ 21.23 | $10.98 | $0.41 | $1.23 |
| 1965 | 59.52 | 25.41 | 13.49 | 0.53 | 1.58 |
| 1966 | 70.40 | 31.37 | 17.23 | 1.17 | 3.38 |
| 1967 | 72.75 | 32.25 | 17.83 | 1.25 | 3.50 |
| 1968 | 76.42 | 32.34 | 17.93 | 1.23 | 3.29 |
| 1969 | 85.74 | 36.27 | 19.97 | 1.29 | 3.30 |
| 1970 | 91.91 | 36.99 | 19.80 | 0.88 | 2.17 |
| 1971 | 92.91 | 33.60 | 16.78 | 0.63 | 1.48 |
| 1972 | 103.40 | 35.42 | 18.22 | 0.68 | 1.57 |
| 1973 | 120.03 | 42.35 | 22.63 | 0.79 | 1.77 |
| 1974 | 139.67 | 52.48 | 26.77 | 1.21 | 2.46 |
| 1975 | 142.42 | 53.66 | 25.37 | 1.19 | 2.12 |
| 1976 | 158.44 | 58.53 | 27.50 | 1.02 | 1.70 |
| 1977 | 184.82 | 67.48 | 32.77 | 1.14 | 1.77 |
| 1978 | 217.76 | 78.58 | 39.46 | 1.76 | 2.50 |
| 1979 | 254.96 | 95.92 | 48.50 | 2.70 | 3.49 |
| 1980 | 282.80 | 112.33 | 55.36 | 3.57 | 4.25 |
| 1981 | 315.22 | 126.54 | 59.81 | 3.36 | 3.62 |
| 1982 | 310.58 | 120.68 | 55.35 | 3.41 | 3.41 |
| 1983 | 304.78 | 116.20 | 53.08 | 2.91 | 3.06 |
| 1984 | 354.44 | 138.82 | 66.24 | 3.57 | 3.79 |
| 1985 | 387.13 | 153.48 | 73.27 | 3.45 | 3.74 |
| 1986[r] | 379.47 | 142.69 | 69.14 | 3.80 | 4.08 |
| 1987 | 388.60 | 145.46 | 70.91 | 3.55 | 3.82 |
| 1988[E] | 422.96 | 159.68 | 75.75 | 3.60 | 3.65 |

Source: U.S. Department of Commerce, Bureau of Economic Analysis (BEA), Quarterly Report.

*a* Data are company-based (not establishment- or product-based) and represent corporate entities whose principal activity falls in SIC Codes 372 and 376.

*b* Aerospace constant dollars based on BEA's industry deflator for historical data, and Durable Goods deflator for current year estimates.

*E* Estimate.

*r* Revised.

# NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
# MAJOR CONTRACTORS

Fiscal Years 1983-1987
By rank according to net value of NASA prime contracts awarded during last fiscal year
(Millions of Dollars)

| Company | 1983 | 1984 | 1985 | 1986 | 1987 |
|---|---|---|---|---|---|
| **TOTAL PROCUREMENTS** | $6,797 | $7,354 | $8,298 | $8,180 | $8,610 |
| **Awards to Business Firms** | 5,586 | 5,967 | 6,653 | 6,356 | 6,541 |
| **% of TOTAL PROCUREMENTS** | 82% | 81% | 80% | 78% | 76% |
| Rockwell International Corp. | $1,568 | $1,402 | $1,345 | $1,156 | $1,610 |
| Martin Marrietta Corp. | 466 | 428 | 483 | 427 | 326 |
| Lockheed Space Operations Co. | 19 | 301 | 551 | 559 | 323 |
| Morton Thiokol Inc. | 268 | 322 | 334 | 320 | 286 |
| McDonnell Douglas Corp. | 237 | 200 | 194 | 266 | 285 |
| General Electric Co.[b] | 142 | 112 | 145 | 207 | 225 |
| USBI Booster Production Co. | 115 | 197 | 207 | 196 | 183 |
| Boeing Co. | 44 | 44 | 69 | 113 | 175 |
| United Technologies Corp. | 116 | 118 | 110 | 97 | 166 |
| Lockheed Engrg. & Mgmt. Co. Inc. | 101 | 105 | 125 | 124 | 163 |
| Allied Bendix Aerospace | 137 | 163 | 150 | 138 | 142 |
| EG&G Florida Inc. | 68 | 109 | 108 | 117 | 131 |
| TRW Inc. | 49 | 82 | 103 | 85 | 124 |
| Ford Aerospace & Communications | 107 | 106 | 120 | 208 | 120 |
| Lockheed Missiles & Space Co. | 96 | 102 | 137 | 121 | 108 |
| Computer Sciences Corp. | 147 | 89 | 102 | 96 | 90 |
| Contel Corp. | (a) | (a) | (a) | 69 | 81 |
| IBM Corp. | 116 | 134 | 124 | 94 | 72 |
| Pan American World Serv. Inc. | 36 | 40 | 49 | 47 | 60 |
| Orbital Sciences Corp. | (a) | (a) | (a) | (a) | 42 |
| Teledyne Industries Inc. | 47 | 52 | 46 | 48 | 38 |
| Planning Research Corp. | 57 | 57 | 65 | 51 | 37 |
| Perkin Elmer Corp. | 70 | 79 | 64 | 24 | 35 |
| Raytheon Service Co. | 21 | 28 | 25 | 28 | 32 |
| BAMSI Inc. | (a) | 5 | 13 | 19 | 31 |
| Northrop Services Inc. | 29 | 32 | 39 | 41 | 30 |
| Boeing Technical Operat. Inc. | 86 | 25 | 39 | 36 | 27 |
| Unisys Corp.[c] | 27 | 25 | 25 | 18 | 27 |
| Sverdrup Technology Inc. | (a) | 8 | 7 | 15 | 27 |
| Aerojet General Corp. | 4 | (a) | 10 | 20 | 26 |

Source: National Aeronautics and Space Administration, "NASA Annual Procurement Report" (Annually)
a Not in list of major contractors for indicated year(s)
b Includes awards previously reported for RCA Corp.
c Includes awards previously reported for Sperry Corp.

## DEPARTMENT OF DEFENSE MAJOR CONTRACTORS

Fiscal Years 1983-1987
Listed by rank according to net value of
prime contracts awarded during last fiscal year
(Millions of Dollars)

| Company | 1983 | 1984 | 1985 | 1986 | 1987 |
|---|---|---|---|---|---|
| TOTAL CONTRACTS | $128,242 | $133,571 | $150,674 | $145,742 | $142,483 |
| McDonnell Douglas Corp. | $ 6,143 | $ 7,684 | $ 8,857 | $ 6,586 | $ 7,715 |
| General Dynamics Corp. | 6,818 | 5,952 | 7,440 | 8,013 | $ 7,041 |
| General Electric Co. | 4,518 | 4,514 | 5,891 | 6,847 | 5,802 |
| Lockheed Corp. | 4,006 | 4,967 | 5,082 | 4,896 | 5,574 |
| General Motors Corp. | 4,133 | 4,250 | 5,165 | 5,069 | 4,082 |
| Raytheon Co. | 2,728 | 3,093 | 2,999 | 4,052 | 3,820 |
| Martin Marietta Corp. | 2,272 | 2,261 | 2,717 | 2,935 | 3,726 |
| United Technologies Corp. | 3,867 | 3,207 | 3,906 | 3,527 | 3,587 |
| Boeing Co. | 4,423 | 4,654 | 5,458 | 3,556 | 3,547 |
| Grumman Corp. | 2,298 | 2,419 | 2,733 | 2,967 | 3,393 |
| Unisys Corp. | 1,362 | 1,880 | 1,909 | 1,897 | 2,268 |
| Rockwell International Corp. | 4,545 | 6,219 | 6,264 | 5,590 | 2,238 |
| Tenneco Inc. | 1,792 | 749 | 1,250 | 477 | 2,053 |
| Litton Industries Inc. | 2,169 | 2,441 | 1,528 | 1,663 | 2,035 |
| Honeywell Inc. | 1,114 | 1,364 | 1,908 | 1,846 | 2,008 |
| IBM Corp. | 1,437 | 1,572 | 1,783 | 1,359 | 1,822 |
| Westinghouse Electric Corp. | 1,776 | 1,944 | 1,941 | 1,713 | 1,684 |
| Textron Inc. | 870 | 869 | 1,920 | 1,671 | 1,546 |
| GTE Corp. | 1,074 | 708 | 611 | 1,041 | 1,475 |
| LTV Corp. | 1,445 | 655 | 1,685 | 1,445 | 1,308 |
| TRW Inc. | 1,137 | 983 | 1,079 | 1,053 | 1,135 |
| Texas Instruments Inc. | 867 | 956 | 1,425 | 1,435 | 1,109 |
| Northrop Corp. | 841 | 882 | 1,196 | 742 | 1,068 |
| ITT Corp. | 903 | 1,140 | 1,567 | 799 | 995 |
| Allied Signal Inc. | 776 | 758 | 1,348 | 1,043 | 943 |
| Gencorp Inc. | 1,607 | 657 | 566 | 643 | 874 |
| Singer Co. | 950 | 561 | 752 | 871 | 814 |
| FMC Corp. | 1,238 | 1,157 | 831 | 863 | 744 |
| Gibbons Green Van Amerongen | 181 | 341 | 81 | 465 | 721 |
| Morton Thiokol Inc. | 281 | 469 | 318 | 236 | 706 |

Source: Department of Defense, "Statistical Digest of Prime Contract Awards" (Annually)

a. Not in top 100 companies for indicated years.
b. Includes amounts subsequently reported for previous fiscal years.
c. Includes amounts subsequently reported for Allied Signal Aerospace Company.
d. Includes amounts subsequently reported for Martin Marietta Corp.

# DEPARTMENT OF DEFENSE
# PRIME CONTRACT AWARDS OVER $25,000
# FOR SELECTED MAJOR MILITARY HARD GOODS

By Geographic Region
Fiscal Years 1985, 1986 and 1987

| Program and Region | Millions of Dollars | | | Percent of Program Total | | |
|---|---|---|---|---|---|---|
| | 1985 | 1986 | 1987 | 1985 | 1986 | 1987 |
| AIRCRAFT—TOTAL | $38,449 | $35,281 | $29,478 | 100.0% | 100.0% | 100.0% |
| New England | 4,633 | 3,578 | 3,470 | 12.0 | 10.1 | 11.8 |
| Middle Atlantic | 4,577 | 4,463 | 3,765 | 11.9 | 12.6 | 12.8 |
| East North Central | 4,105 | 4,202 | 3,059 | 10.7 | 11.9 | 10.4 |
| West North Central | 6,737 | 5,015 | 4,820 | 17.5 | 14.2 | 16.4 |
| South Atlantic | 4,461 | 4,398 | 4,448 | 11.6 | 12.5 | 15.1 |
| East South Central | 455 | 392 | 352 | 1.2 | 1.1 | 1.2 |
| West South Central | 4,118 | 4,898 | 4,027 | 10.7 | 13.9 | 13.7 |
| Mountain | 564 | 766 | 1,394 | 1.5 | 2.2 | 4.7 |
| Pacific[a] | 8,801 | 7,659 | 4,145 | 22.9 | 21.5 | 14.1 |
| MISSILE & SPACE SYSTEMS—TOTAL | $21,510 | $21,510 | $21,631 | 100.0% | 100.0% | 100.0% |
| New England | 3,158 | 3,950 | 3,443 | 15.4 | 18.4 | 15.8 |
| Middle Atlantic | 1,090 | 1,036 | 1,262 | 5.3 | 4.8 | 5.8 |
| East North Central | 166 | 173 | 193 | 0.8 | 0.8 | 0.9 |
| West North Central | 1,306 | 1,264 | 1,209 | 6.4 | 5.9 | 5.6 |
| South Atlantic | 2,072 | 1,863 | 1,424 | 10.1 | 8.7 | 6.6 |
| East South Central | 317 | 615 | 627 | 1.6 | 2.9 | 2.9 |
| West South Central | 1,570 | 1,977 | 1,516 | 7.7 | 9.2 | 7.0 |
| Mountain | 1,973 | 2,469 | 3,588 | 9.6 | 11.5 | 16.6 |
| Pacific[a] | 8,824 | 8,162 | 8,390 | 43.1 | 37.9 | 38.8 |
| ELECTRONICS & COMMUNICATIONS EQUIPMENT—TOTAL | $23,161 | $21,050 | $23,866 | 100.0% | 100.0% | 100.0% |
| New England | 1,988 | 2,135 | 2,819 | 8.6 | 10.1 | 11.8 |
| Middle Atlantic | 5,242 | 4,373 | 4,281 | 22.6 | 20.8 | 17.9 |
| East North Central | 1,215 | 1,715 | 1,715 | 5.8 | 7.2 | 7.2 |
| West North Central | 1,623 | 1,502 | 1,489 | 7.0 | 7.1 | 6.2 |
| South Atlantic | 4,841 | 5,192 | 6,345 | 20.9 | 24.7 | 26.6 |
| East South Central | 153 | 126 | 136 | 0.7 | 0.6 | 0.6 |
| West South Central | 1,272 | 963 | 926 | 5.5 | 4.6 | 3.9 |
| Mountain | 842 | 847 | 1,042 | 3.6 | 4.0 | 4.4 |
| Pacific[a] | 5,592 | 4,697 | 5,134 | 24.1 | 22.3 | 21.5 |

Source: Department of Defense, "Prime Contract Awards by Region and State" (Annual).
NOTE: Detail may not add to totals because of rounding.
a. Includes Alaska and Hawaii.

# Glossary

**Aeronautics:** the science that treats of the operation of aircraft, also, the art or science of operating aircraft.

**AIA:** Aerospace Industries Association of America, Inc., formerly Aircraft Industries Association.

**Aerospace Industry:** the industry engaged in research, development and manufacture of aerospace systems, including manned and unmanned aircraft; missiles, space launch vehicles, and spacecraft; propulsion, guidance and control units for all of the foregoing; and a variety of airborne and ground based equipment essential to the test, operation, and maintenance of flight vehicles.

**Aerospace Employment:** annual average calculated as one-twelfth of sum of monthly estimates of total number of persons employed during a designated pay period by the aircraft and missile and space industries (SIC 372 and 376) plus estimated aerospace-related employment in the communications equipment (SIC 3662) and instruments (SIC 381 and 382) industries and in certain other industries (SIC 28, 35, 73, 89, etc.).

**Aerospace Payroll:** estimated on the basis of average weekly earnings for a given calendar year for production workers plus an estimated annual salary for other employees.

**Aerospace Sales:** the AIA estimate of aerospace industry sales, developed by summing DOD expenditures for aircraft, missiles, and space related procurement and RDT&E, NASA expenditures for research and development, and space flight control and data communications, outlays for space activities by other U.S. Government departments and agencies, commercial sales of space-related products, net domestic and export sales of civil aircraft, engines, and parts, FMS and commercial exports of military aircraft, missiles, propulsion, and related parts, and sales of related products and services, including electronics, software, and ground support equipment, plus sales of non-aerospace products which are produced in aerospace-manufacturing establishments and which use technology, processes, and materials derived from the aerospace industry. See also Related Products and Services.

**Air Carriers:** the commercial system of air transportation, consisting of domestic and international scheduled and charter service.

**Aircraft:** all airborne vehicles supported either by buoyancy or by dynamic action. Used in this volume in a restricted sense to mean an airplane—any winged aircraft, including helicopters but excluding gliders and guided missiles.

**Aircraft Agreement** (Agreement on Trade in Civil Aircraft): negotiated in the Tokyo Round of the Multilateral Trade Negotiations, and implemented January 1, 1980, providing for elimination of tariff and non-tariff trade barriers in the civil aircraft sector.

**Aircraft Industry:** the industry primarily engaged in the manufacture of aircraft, aircraft engines and parts, aircraft propellers and parts, and aircraft parts and auxiliary equipment. A sector of the **Aerospace Industry.**

**Airframe:** the structural components of an airplane, such as fuselage, empennage, wings, landing gear, and engine mounts, but excluding such items as engines, accessories, electronics and other parts that may be replaced from time to time.

**Airlines:** see **Air Carriers.**

**Appropriation** (Federal Budget): an act of Congress authorizing an agency to incur obligations and make payments out of funds held by the Department of the Treasury.

**Assets, Net:** the sum of all recorded assets after reducing such amount by allowance of reserve for bad debts, depreciation and amortization, but before deducting any liabilities, mortgages or other indebtedness.

**Astronautics:** the art and science of designing, building and operating manned or unmanned space objects.

**Average Weekly Hours:** average hours for which pay was received; different from standard or scheduled hours.

**Avionics:** Communications, navigation, flight controls, and displays.

**Backlog:** the sales value of orders accepted (supported by legal documents) that have not yet passed through the sales account.

**Budget Authority:** authority provided by the Congress, mainly in the form of **Appropriations,** which allows Federal agencies to incur obligations to spend or lend money.

**Bureau of the Census:** an agency of the Department of Commerce.

**Bureau of Economic Analysis** (BEA): an agency of the Department of Commerce.

**Bureau of Labor Statistics** (BLS): an agency of the Department of Labor.

**Constant Dollars,** see **Deflator.**

**Deflator:** index used to convert a price level to one comparable with the price level at a different time, offsetting the effect of inflation. The base period, which equals 100, is usually specified as either a given fiscal or calendar year. **Constant Dollars** are calculated by dividing current ("then year") dollars by appropriate price deflator and multiplying by 100.

**Depreciation:** the general conversion of the depreciable cost of a fixed asset into expense, spread over its remaining life. There are a number of methods, all based on a periodic charge to an expense account and a corresponding credit to a reserve account.

**Development:** the process or activity of working out a basic design, idea or piece of equipment (see **Research**).

**DOD:** Department of Defense.

**DOE:** Department of Energy.

**DOT:** Department of Transportation.

**Durable Goods Industry:** comprised of major manufacturing industry groups with SIC Codes 24, 25, and 32-39. All major manufacturing industry groups in SIC Codes 20-23 and 26-31 are considered nondurable goods manufacturing industry groups.

**Earnings:** the actual return to the worker for a stated period of time. Irregular bonuses, retroactive items, payments of various welfare benefits, and payroll taxes paid by employers are excluded.

**Average Hourly Earnings:** on a "gross" basis, reflecting not only changes in basic hourly and incentive wage rates, but also such variable factors as premium pay for overtime and late shift work, and changes in output of workers paid for an incentive plan.

**Average Weekly Earnings:** derived by multiplying average weekly hours by hourly earnings.

**ERDA:** Energy Research and Development Administration. ERDA was formed in 1974 to bring together activities previously scattered among several agencies. The major elements covered were nuclear energy, fossil energy, solar and geothermal energy, conservation through increased efficiency and environmental controls. Most of these functions were assumed by the Department of Energy as of October 1, 1977.

**Establishment:** the basis for reporting to the Census of Manufacturers; an operating facility in a single location.

**Evaluation:** (Department of Defense) determination of technical suitability of material, equipment or a system; see **RDT&E.**

**Expenditures** (Federal Budget): see **Outlays.**

**Exports:** domestic merchandise including commodities which are grown, produced, or manufactured in the United States, and commodities of foreign origin which have been changed in the United States from the form in which they were imported, or which have been enhanced in value by further manufacture in the United States, and which are traded or sold to other nations.

**Export-Import Bank of the United States (Eximbank):** created in 1934, and established as an independent U.S. Government Agency in 1945. Eximbank is designed "... to aid in financing and to facilitate exports ..." Eximbank receives no appropriations from the U.S. Congress. It is directed by statute to (1) offer financing that is competitive with that offered exporters of other countries by their official export credit institutions, (2) determine that the transactions supported provide for a reasonable assurance of repayment, (3) supplement,

but not compete with private sources of export financing, and (4) take into account the effect of its activities on small business, the domestic economy, and U.S. employment.

**FAA:** Federal Aviation Administration (formerly the Federal Aviation Agency), an agency of the Department of Transportation.

**Facility:** a physical plant or installation including real property, building, structures, improvements and plant equipment.

**Fiscal Year** (Federal Budget): until June 30, 1976, year beginning July 1 and ending June 30, and designated by the year in which it ends. Beginning October 1, 1976, the fiscal years run from October 1 through September 30 and are designated by the year in which they end. A three month **Transition Quarter** from July 1 through September 30, 1976, belongs to neither fiscal year.

**Flyaway Value:** includes the cost of the airframe, engines, electronics, communications, armament and other installed equipment.

**Foreign Military Sales** (FMS): export sales to foreign governments arranged through the Department of Defense, whereby DOD recovers full purchase price and administrative costs; often mistakenly used to include foreign military aid and foreign commercial sales as well.

**FY:** see **Fiscal Year.**

**General Agreement on Tariff and Trade** (GATT): a multilateral treaty, subscribed to by over 80 governments which together account for more than four-fifths of world trade; its aim is to liberalize world trade; the only multilateral instrument that lays down agreed rules for international trade.

**General Aviation:** all civil flying except that of air carriers.

**GNP** (Gross National Product): the market value of the total output of goods and services produced by the nation's economy before deduction of depreciation charges and other allowances for business and institutional consumption of durable goods. It includes the purchase of goods and services by consumers and government, gross private domestic investment and net exports.

**Helicopter:** a rotary-wing aircraft which depends principally for its support and motion in the air upon the lift generated by one or more power-driven rotors, rotating on substantially vertical axes. A helicopter is a **V/STOL.**

**Heliport:** an area, either at ground level or elevated on a structure, that is used for the landing and take-off of **helicopters** and includes some or all of the various facilities useful to helicopter operations such as helicopter parking, hangar, waiting room, fueling and maintenance equipment.

**Helistop:** a minimum facility **heliport,** either at ground level or elevated on a structure for the landing and takeoff of **helicopters** but without such auxiliary facilities as waiting room, hangar parking, etc.

**ICBM:** Intercontinental Ballistic Missile, with a range of more than 5,000 miles.

**Imports:** classified as "general imports" or "imports for consumption." This volume refers generally to "imports for consumption," which are entries for immediate consumption plus merchandise withdrawn from bonded storage warehouses for consumption. Data are compiled from Import Entries filed with U.S. Customs officials, and are in general based on the market value or price in the foreign country at the time of exportation of such merchandise, including the cost of containers and coverings, as well as other charges and expenses incidental to placing the merchandise in condition, packed and ready for shipment to the United States, but excluding import duties, insurance, freight and other charges incidental to arrival of the goods in the United States. The foreign values of imported merchandise are converted into U.S. currency at the rate of exchange prevailing on the day the merchandise is shipped to the United States.

**Income:**

**Net Operating Income:** total net sales (see **Sales**) less total operating costs.

**Net Income (Before Income Taxes): Net Operating Income** plus or minus "**Other Income and Expenses.**"

**Other Income and Expenses:** includes interest income, royalty income, capital gains and losses, interest expense, cash discounts, etc.

**Net Income (After Income Taxes): Net Income (Before Taxes)** less federal income taxes.

**Lump-Sum Wage Payment:** a one time payment given in lieu of general wage increases and/or cost of living adjustments in labor settlements.

**Manufacturing Industries:** those **establishments** engaged in the mechanical or chemical transformation of inorganic or organic substances into new products, and usually described as plants, factories, or mills, which characteristically use power driven machines and materials-handling equipment; also establishments engaged in assembling component parts of manufactured products if the new product is neither a structure nor other fixed improvement.

**Merchandise Trade Balance:** the difference between the value of U.S. goods exported to other countries and foreign goods imported into this country. The trade balance is generally regarded as "favorable" when **exports** exceed **imports**—a trade surplus—and "unfavorable" when **imports** exceed **exports**—a trade deficit.

**Missile:** sometimes applied to space launch vehicles, but more properly connotes automated weapons of warfare, i.e., a weapon which has an integral system of guidance, as opposed to the unguided rocket.

**Multilateral Trade Negotiations** (MTN): a forum within the **GATT** in which countries negotiate to overcome their trade problems. In September 1973, in Tokyo, over 100 nations launched new multilateral trade negotiations, called the "Tokyo Round," covering both tariff and non-tariff barriers to trade in industrial and agricultural products, and improvements in the **GATT** itself.

**NASA:** National Aeronautics and Space Administration.

**NATO:** North Atlantic Treaty Organization.

**New Obligational Authority** (Federal Budget): see **Budget Authority.**

**Non-Aerospace Products and Services:** products and services other than aircraft, missiles, space vehicles, and related propulsion and parts, produced or performed by establishments whose principal business is the development and/or manufacture of aerospace products.

**OASD:** Office of the Assistant Secretary of Defense.

**Obligations** (Federal Budget): commitments made by Federal agencies to pay out money for products, services or other purposes—as distinct from the actual payments. Obligations incurred may not be larger than **budget authority.**

**Orders, Net New:** the sales value of new orders (supported by legal documents) minus cancellations during the period.

**Other Aerospace Products and Services:** all conversions, modifications, site activation, and other aerospace products (including drones) and services, plus research and development under contract, defined as basic and applied research in the sciences and in engineering, and design and development of prototype products and processes.

**Outlays:** checks issued, interest accrued on the public debt, or other payments made, net of refunds and reimbursements.

**Overtime Hours:** that portion of the gross average weekly hours which was in excess of regular hours and for which premium payments were made.

**Payroll, All Manufacturing:** includes the gross earning paid in the calendar year to all employees on the payroll of operating manufacturing **establishments.** Includes all forms of compensation paid directly to workers such as salaries, wages, commissions, dismissal pay, all bonuses, vacation and sick leave pay, and compensation in kind, prior to such deductions as employees' Social Security contributions, withholding taxes, group insurance, union dues, and savings bonds. Does not include employers' Social Security contributions or other non-payroll labor costs such as employees' pension plans, group insurance premiums, and workmen's compensation.

**Passenger-Mile:** one passenger moved one mile.

**Procurement:** the process whereby the executive agencies of the Federal Government acquire goods and services from enterprises other than the Federal Government.

**Production Workers:** includes working foremen and all non-supervisory workers (including leadmen and trainees) engaged in fabricating, processing, assembling, inspection, receiving, storage, handling, janitorial services, product development, auxiliary production for plant's own use and record

keeping and services closely associated with the above production operations.

**R&D:** Research and Development.

**Research:** systematic study directed toward fuller scientific knowledge or understanding of the subject studied. Research is classified as either **basic** or **applied** according to the objectives of the sponsoring agency.

**Basic Research:** with the objective of gaining fuller knowledge or understanding of the fundamental aspects of phenomena and of observable facts without specific applications toward processes or products in mind.

**Applied Research:** with the objective of gaining knowledge or understanding necessary for determining the means by which a recognized and specific need may be met.

**Development:** the systematic use of scientific knowledge directed toward the production of useful materials, devices, systems, or methods including design and development of prototype and processes.

**Independent Research and Development** (IR&D): a term devised by the Department of Defense and used by Federal agencies to differentiate between a contractor's research and development technical effort performed under a contract, grant, or other arrangement (R&D) and that which is self-initiated and self-funded (IR&D).

**Industrial Research and Development:** research and development work performed within company facilities, funded by company or Federal funds, and excluding company-financed research and development contracted to outside organizations such as research institutions, universities and colleges, or other non-profit organizations.

**RDT&E:** (Department of Defense): Research, Development, Test and Evaluation.

**Related Products and Services:** Sales of electronics, software, and ground equipment in support of aerospace products, plus sales by aerospace manufacturing establishments of systems and equipment which are generally derived from the industry's aerospace technological expertise in design, materials, and processes, but which are intended for applications other than flight.

**Research:** see **R&D.**

**Rotorcraft:** an aircraft which in all its usual flight attitudes is supported in the air wholly or in part by a rotor or rotors, *i.e.*, airfoils rotating or revolving about an axis (see **Helicopter**).

**Sales:** net of returns, allowances, and discounts, the dollar value of shipments, including dealer's commission, if any, which have passed through the sales account.

**Satellite:** a body that revolves around a larger body, such as the moon revolving around the earth, or a man-made object revolving about any body such as the sun, earth, or moon.

**SIC** (Standard Industrial Classification): a system developed by the U.S. Government to define the industrial composition of the economy, facilitating comparability of statistics. See **Aerospace Industry** for explanation of SIC codes applicable to the aerospace industry.

**Space Vehicle:** an artificial body operating in outer space (beyond the earth's atmosphere).

**Stockholder's Equity: assets** minus all obligations of the corporation, except those to stockholders. Annual data are average equity for the year (using four end-of-quarter figures.) For details, see "Quarterly Financial Report for Manufacturing, Mining and Trade Corporations," compiled by the Bureau of the Census.

**STOL:** short take-off and landing aircraft.

**Test** (Department of Defense): an experiment designed to assess progress in attainment or accomplishment of development objectives (see **RDT&E**).

**Thrust:** the driving force exerted by an engine, particularly an aircraft or missile engine, in propelling the vehicle to which it is attached.

**Ton-Mile:** one ton moved one mile.

**Total Obligational Authority:** the sum of **budget authority** granted or requested from the Congress in a given year, plus unused **budget authority** from prior years.

**Trade Balance:** see **Merchandise Trade Balance.**

**Transition Quarter** (Tr. Qtr.): the three-month interval from July 1, 1976 to September 30, 1976. See **Fiscal Year.**

**Turbine, Turbo:** a mechanical device or engine that spins in reaction to a fluid flow that passes through or over it. Frequently used in "turboprop" or "turbojet."

**U.K.:** United Kingdom.
**U.S.:** United States of America.
**USA:** United States Army, an agency of the U.S. Department of Defense.
**USAF:** United States Air Force, an agency of the U.S. Department of Defense.
**USN:** United States Navy, an agency of the U.S. Department of Defense.
**USSR:** Union of Soviet Socialist Republics.
**Utility Aircraft:** an aircraft designed for general purpose flying.

**V/STOL:** vertical short take-off and/or landing aircraft.

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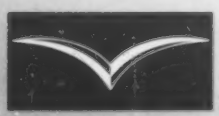

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